



Guide to  
**PLANT FAMILIES**  
of southern Africa

M. Koekemoer, H.M. Steyn & S.P. Bester





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# *S* T R E L I T Z I A

This series has replaced *Memoirs of the Botanical Survey of South Africa* and *Annals of the Kirstenbosch Botanic Gardens* which the South African National Biodiversity Institute (SANBI) inherited from its predecessor organisations.

The plant genus *Strelitzia* occurs naturally in the eastern parts of southern Africa. It comprises three arborescent species, known as wild bananas, and two acaulescent species, known as crane flowers or bird-of-paradise flowers. The logo of SANBI is partly based on the striking inflorescence of *Strelitzia reginae*, a native of the Eastern Cape and KwaZulu-Natal that has become a garden favourite worldwide. It symbolises the commitment of the Institute to champion the exploration, conservation, sustainable use, appreciation and enjoyment of South Africa's exceptionally rich biodiversity for all people.

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## Foreword

For the identification of an unknown flowering plant, the first step usually is to establish the family to which it belongs. If one knows the family, many species can be eliminated and the search for a name becomes more directed. *Guide to plant families of southern Africa* is the first of its kind for the region. This splendidly illustrated book with its concise and informative text provides practical help for those interested in learning the special skill of identifying the most important plant families in southern Africa. As professional plant taxonomists, Marinda Koekemoer, Hester Steyn and Pieter Bester have extensive experience of plant identification in the region and are particularly well qualified to introduce the topic to the general public.

The floristic richness of southern Africa is unequalled anywhere else in the world on a subcontinental scale. With about 22 800 species of flowering plants alone, the identification of species presents particular challenges to both nature lovers and professional botanists. Somehow one needs to establish a classification framework to organise this wealth of plants. Fortunately, there is a deep orderliness within this diversity, as in all life. The field of scientific classification, or taxonomy, sets out to detect such natural patterns and to order and name the various groupings. For centuries natural groups, known as families, have been recognised by layperson and taxonomist alike. The family is a fundamental unit in the classification of plants and it groups together species and genera based on assumed common descent.

Family recognition is the most powerful approach towards plant identification, and it is essential for mastering this skill. Although southern African flowering plants comprise about 220 families, most are relatively small with only a few species each. Most species belong to one of a few large families. For example, just 20 families account for almost 70% of the region's species, with more than 50% of the species belonging to only ten families. Being able to identify these ten largest families, one can, at least theoretically, identify almost 12 000 plant species to family level! Rarely are the practical benefits of learning the diagnostic characters of only a few taxonomic groupings as rewarding as in the case of flowering plant families.

Besides facilitating species identification, the most significant advantage of recognising plant families is its predictive value. Knowing the plant family is immensely empowering in that it allows one to foretell some of the properties of a plant even before it has been identified to species level. Because of common descent, most members of a family possess a basic uniformity brought about by their many shared features. By knowing the properties of a family as a whole, one can immediately infer a great deal of information about its members, such as the particular floral morphology, anatomy and cytological and chemical characteristics. More often than not, such inferences are accurate, even in respect of a member of the family not previously investigated.

*Guide to plant families of southern Africa* is a welcome deviation from the highly technical keys to plant families that hitherto have dominated our botanical literature. It uses an easy-to-understand group-recognition approach combined with photographs and diagnostic characters to help narrow down the families to which a plant could possibly belong. Each family entry contains a wealth of fascinating information, including notes on diversity, distribution, diagnostic characters and ecological and economic significance, all supplemented by beautiful photographs depicting several members of the family. Written principally for non-scientists, this book should appeal to people in various walks of life. Traditionally, the family has featured prominently in the training of biologists, especially botanists. Hence, this book should also be useful to teachers and students. No doubt, the knowledge contained in this attractive, informative and carefully organised guide will enhance the understanding of the flora of southern Africa and beyond. I strongly recommend it to all nature lovers.



**Abraham E. van Wyk**  
University of Pretoria  
October 2012



# Introduction

## Background

The Flora of southern Africa (FSA) region includes South Africa, Namibia, Botswana, Swaziland and Lesotho. This region has a rich floristic diversity of  $\pm 23\,000$  species of flowering plants which represents more than 10% of the world's plants. The richness of the flora can be attributed mainly to both a diverse climate and landscape. The flora is made up of gymnosperms (e.g. cycads, pines, yellowwoods) represented by six families (68 species); the mosses by 97 families (903 species); ferns by 34 families (321 species) and 220 flowering plant families (22 800 species). The five largest families in the region are Asteraceae (daisies), Mesembryanthemaceae (vygies), Fabaceae (legumes), Iridaceae (irises) and Poaceae (grasses).

Knowing the names of plants enhances one's enjoyment and understanding of not only plants but also the natural environment as a whole. If one can attach a name to something, it acquires a firm position in one's frame of reference, has more meaning and fosters appreciation. It is also then easier to communicate about the plant and to find more information on it. With the large number of plant species in southern Africa identification is relatively difficult. The first step is usually to determine which family a plant belongs to. This can be done by familiarising oneself with the diagnostic characters of families.

Surprisingly, there is no user-friendly, well-illustrated publication on the southern African flora to assist scholars, students, amateurs and professionals to identify plant families. *Flowering Plants of the World* (Heywood *et al.* 2007), is a useful reference work but covers the families of the world and has very few southern African examples.

With this guide, we aim to produce a comprehensive, well-illustrated publication enabling readers to identify the 52 largest plant families of southern Africa. This includes more than 90% of the species in the region.

The initial thought was to cover the 50 largest families, but there is a 'natural' gap between the size of the 52nd and the 53rd family. Therefore, we have decided to in-

clude the 52 largest families in this guide (see *Appendices A and B*), which coincidentally challenges the reader to learn one family per week over a calendar year.

## About this guide

General consensus has not been reached on the interpretation and delimitation of all plant families and current concepts are often based on the results of ongoing molecular work. The family delimitations used in this guide follow Leistner (2000), except for the families Scrophulariaceae and Orobanchaceae which are treated as two separate families. Recent advances in DNA-based studies propose different interpretations of relationships and family concepts (APG II, III & IV), but we have decided to follow a more conservative approach and to use family concepts that are largely based on morphological characters (generally supported by APG II concepts).

The number of genera and species per family in the FSA region, as recorded here, is according to information in PRECIS (PRE Computerised Information System—the plant database of the South African National Biodiversity Institute [SANBI]) as in February 2012, except where experts advised otherwise. The term 'species', as used in this guide, refers to species or to subspecific ranks (which include subspecies, varieties and formas) where applicable.

Common names can be confusing, as different plants may have the same common name, while different common names may refer to the same plant. However, common names are widely used by the public, and we have tried to include at least an English, Afrikaans (A) and, where possible, an African name in the *Flagship species* sections. Abbreviations used in the text refer to the following languages: NS (Northern Sotho), SS (Southern Sotho), T (Tswana), X (Xhosa) and Z (Zulu).

Throughout this guide, the emphasis is on indigenous southern African species and most examples used are indigenous, except in the sections on *Significance*. Where exotic or naturalised species are used as examples, these are indicated by an asterisk (\*).

## Photo credits

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## How to use this guide

The aim of this guide is to enable the reader to identify plants to family level. The 52 families are arranged in three main categories: grasses and grass-like plants, monocotyledons (excluding grasses and grass-like plants) and dicotyledons. Within these categories, the families have been sorted into six groups using a combination of common characters (see *Key to groups of plant families*). Families within a group are in alphabetical order.

When trying to identify a plant, it is recommended that the reader use the *Key to groups of plant families* to establish a possible family group. Once the group has been identified, the reader can use the *Quick guide to plant families* or page through the relevant group and either read the diagnostic characters of the relevant families or compare the images of members of the families with the unknown plant.

Each family page contains a short introductory paragraph, a section with *General information* to give an

indication of size, growth form and habitat as well as a species-richness map to show the *Distribution* within the region. The *Flagship species* (chosen by the authors and guided by availability of information and images) gives more information on a well-known member of the specific family. Notes on the *Significance* of the family and illustrated diagnostic characters (*How to identify*) are also included. The section *Families with specialised flowers* deals with the six families in which flowers are difficult to interpret.

Each family has at least one double page with images depicting variation within the family. For the 'big five' (Asteraceae, Mesembryanthemaceae, Fabaceae, Iridaceae and Poaceae) additional pages were added to illustrate the next level of classification (subfamilies or tribes) and their diagnostic characters. As the focus of this guide is on plant family level, the images are identified to genus level only.

**Make it a year of plant families: get to know one family a week!**



# Key to groups of plant families

## Monocotyledons (grasses and grass-like plants)

Flowers small, without colourful petals, arranged in spikelets subtended or enclosed by bracts

### Group 1

Cyperaceae  
Poaceae  
Restionaceae



## Monocotyledons (excluding grasses and grass-like plants)

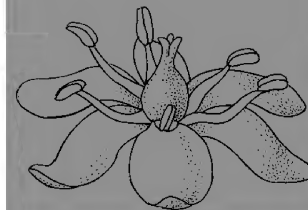
Flowers white or brightly coloured; flower parts 3 or in multiples of 3, with no marked distinction between sepals and petals (=tepals); either all sepal-like, or all petal-like; leaves often strap-shaped with parallel venation, rarely needle-like

Ovary superior

Ovary inferior

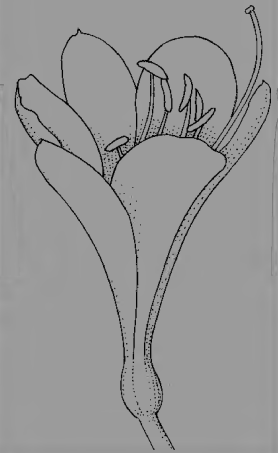
### Group 2

Asparagaceae  
Asphodelaceae  
Colchicaceae  
Eriospermaceae  
Hyacinthaceae



### Group 3

Amaryllidaceae  
Hypoxidaceae  
Iridaceae  
Orchidaceae





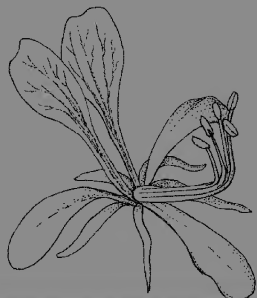
## Dicotyledons

Flower parts 4 or 5, or in multiples of 4 or 5, or very many, usually with a clear distinction between sepals and petals; leaves usually with a distinct midrib and several side veins (pinnately veined)

Flowers with petals (or petal-like structures)  $\pm$  free from one another

### Group 4

Aizoaceae  
Amaranthaceae  
Anacardiaceae  
Apiaceae  
Apocynaceae\*(see Group 5)  
Asteraceae\*(see Group 5)  
Brassicaceae  
Bruniaceae  
Caryophyllaceae  
Celastraceae  
Chenopodiaceae  
Crassulaceae (see Group 5)  
Euphorbiaceae\*  
Fabaceae  
Geraniaceae  
Malvaceae  
Mesembryanthemaceae  
Molluginaceae  
Oxalidaceae  
Polygalaceae  
Proteaceae\*(see Group 5)  
Rhamnaceae  
Rosaceae  
Rutaceae  
Santalaceae  
Sterculiaceae  
Thymelaeaceae (see Group 5)



Flowers with petals (or petal-like structures) clearly fused with one another into a short or long tube

Flowers more or less regular (radially symmetric) in outline (petals all similar in size and shape, arranged around the centre like the spokes of a wheel)

### Group 5

Acanthaceae (see Group 6)  
Apocynaceae  
Asteraceae  
Boraginaceae  
Campanulaceae  
Convolvulaceae  
Crassulaceae  
Cucurbitaceae  
Ericaceae  
Gentianaceae  
Proteaceae  
Rubiaceae  
Scrophulariaceae (see Group 6)  
Solanaceae  
Thymelaeaceae\*



Flowers more or less irregular (bilaterally symmetric) in outline (often appear 2-lipped; petals not uniform in size and shape)

### Group 6

Acanthaceae  
Lamiaceae  
Lobeliaceae  
Orobanchaceae  
Scrophulariaceae



\*The key interprets some characters in a way that is not botanically correct, but rather as they would most likely be observed by many users. See also the section on *Families with specialised flowers*.

# Quick guide to plant families



## GROUP 1

### **Cyperaceae** Sedge family

Culms (=stems) usually solid, often 3-angled. Leaves in 3 ranks, with blade and sheath, sheath forming a tube around the culm.



### **Poaceae** Grass family

Culms hollow, usually cylindrical. Leaves in 2 ranks, with blade and sheath, sheath split open, with free margins.



### **Restionaceae** Cape reed family

Plants either male or female. Culms cylindrical and solid. Leaves reduced to tubular sheaths.



## **Asparagaceae**

### **Asparagus family**

Subshrubs or climbers. Leaves reduced, often scale-like. Flowers small, white or cream, star-like.



## **Asphodelaceae**

### **Aloe family**

Perennials with tuberous roots. Leaves mostly succulent, in a rosette. Inflorescences on long peduncles.



## **Colchicaceae**

### **Colchicum family**

Geophytes. Leaves alternate, sheathing at the base. Fruit a capsule.



## **Eriospermaceae**

### **Eriospermum family**

Tuberous geophytes with leafless inflorescence and woolly seeds.



## **Hyacinthaceae**

### **Chincherinchee family**

Geophytes with rosette of channelled leaves. Leaves appear with the flowers.





## GROUP 3

**Amaryllidaceae****Clivia family**

Bulbous herbs. Leaves strap-shaped, or elliptical, mostly in 2 rows. Flowers usually in an umbel-like structure. Stamens 6.

**Hypoxidaceae****Star lily family**

Geophytes with vertical tuber. Perianth with 6 segments and 6 stamens.

**Iridaceae****Gladiolus family**

Geophytes. Leaves sword-shaped, forming a fan. Flowers with 3 stamens.

**Orchidaceae****Orchid family**

Geophytes. Leaves usually basal, spirally arranged or in 2 rows. Flowers often spurred. Stamens and style fused into a column.



## GROUP 4

**Aizoaceae****Kraalbos family**

Herbs. Flowers small, with petals much reduced or absent.

**Amaranthaceae****Amaranth family**

Leaves alternate or opposite. Flowers very small, in spike-like structures.

**Anacardiaceae****Wild currant family**

Plants mostly woody. Flowers small, green or yellow. Crushed leaves with distinct resinous-scent.

**Apiaceae****Carrot family**

Aromatic herbs or trees. Stems with distinct pith. Leaves usually much-divided with a sheath at base. Flowers in umbels.





## **Apocynaceae**

(see Group 5)

### **Milkweed family**

Leaves mostly opposite.  
Flowers usually in umbels.  
Stamen and pistil fused  
into a complex structure.  
Plants with watery or milky  
sap.



## **Asteraceae**

(see Group 5)

### **Daisy family**

Flowers arranged in a head.  
Anthers fused into a tube.  
Fruit with a pappus.



## **Brassicaceae**

### **Mustard family**

Flowers in raceme. Four  
petals arranged in the form  
of a cross. Fruit a silique.



## **Bruniaceae**

### **Brunia family**

Shrubs. Leaves ericoid with  
black tip. Inflorescence a  
spike or dense head.



## **Caryophyllaceae**

### **Carnation family**

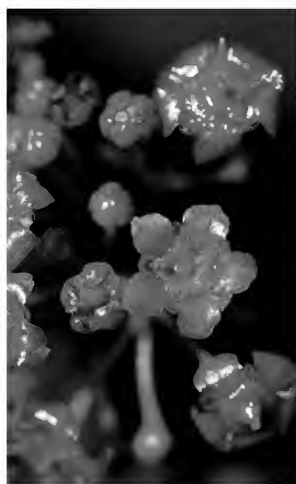
Leaves opposite. Nodes  
often swollen. Tips of petals  
notched or fringed. Styles,  
separate (2–5).



## **Celastraceae**

### **Spike-thorn family**

Woody plants. Branches  
often angular. Flowers  
usually small with nectar-  
secreting disc below the  
ovary.



## **Chenopodiaceae**

### **Salt bush family**

Leaves covered with  
'powdery' indumentum.  
Flowers inconspicuous.



## **Crassulaceae**

(see Group 5)

### **Crassula family**

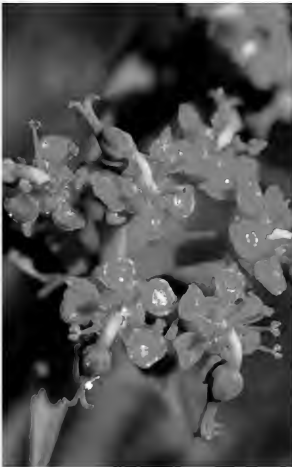
Succulent leaves. Flowers  
with 3–5 separate carpels.



## GROUP 4

**Euphorbiaceae****Euphorbia family**

Usually succulent plants with milky or watery latex. Flowers unisexual. Fruit splits into 3.

**Fabaceae****Pea family**

Pod-bearing plants. Leaves compound with leaf-base frequently swollen.

**Geraniaceae****Pelargonium family**

Aromatic herbs or shrubs. Fruit breaking up into 3–5 parts, each with a spiral awn.

**Malvaceae****Hibiscus family**

Many anthers fused into a distinct column around the style. Star-shaped hairs present.

**Mesembryanthemaceae****Vygie family**

Succulent leaves. Flowers with numerous petals and stamens. Fruit a capsule opening when moistened.

**Molluginaceae****Carpet weed family**

Herbs. Flowers small with 5–10 stamens.

**Oxalidaceae****Oxalis family**

Leaves usually with 3 leaflets. Petals furled in bud. Stamens 10, in two whorls.



## **Polygalaceae**

### **Polygala family**

Flowers resembling those of a pea flower, with a brush-like appendage on the keel-petal.



## **Proteaceae**

(see Group 5)

### **Protea family**

Woody plants. Flowers in heads or spikes.



## **Rhamnaceae**

### **Buffalo-thorn family**

Leaves often glossy.  
Flowers inconspicuous.  
Fruit a fleshy drupe.



## **Rosaceae**

### **Rose family**

Stems sometimes with prickles. Leaves often sheathing at the base. Stipules 2, free or fused to the petiole.



## **Rutaceae**

### **Buchu family**

Plants aromatic. Leaves dotted with glands.



## **Santalaceae**

### **Thesium family**

Plants bluish-green; with reduced leaves and small flowers.



## **Sterculiaceae**

### **Star-chestnut family**

Stamens free or fused into a short tube. Star-shaped hairs present.



## **Thymelaeaceae**

(see Group 5)

### **Fibre-bark family**

Tough fibrous bark. Flowers tubular, often in dense heads.





**Acanthaceae**

(see Group 6)

**Pistol bush family**

Opposite leaves often on swollen nodes. Bracts conspicuous. Fruit an explosive capsule.

**Apocynaceae****Milkweed family**

Leaves mostly opposite. Flowers usually in umbels. Stamen and pistil fused into a complex structure. Plants with watery or milky sap.

**Asteraceae****Daisy family**

Flowers arranged in a head. Anthers fused into a tube. Fruit with a pappus.

**Boraginaceae****Forget-me-not family**

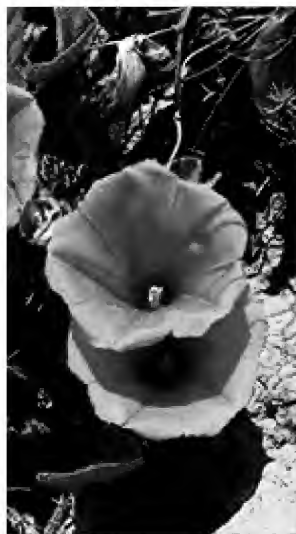
Plants with stiff hairs. Inflorescence often 1-sided and coiled.

**Campanulaceae****Bell flower family**

Bell-shaped flowers, predominantly blue. Anthers free.

**Convolvulaceae****Morning glory family**

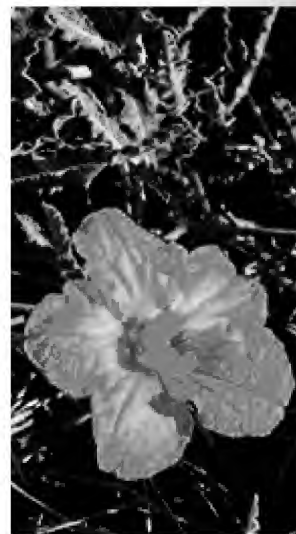
Twining climbing herbs, rarely shrubs. Flowers trumpet-shaped.

**Crassulaceae****Crassula family**

Succulent leaves. Flowers with 3–5 separate carpels.

**Cucurbitaceae****Cucumber family**

Herbs. Stems trailing with coiled tendrils. Whole plant covered with rough hairs.



## **Ericaceae**

### **Erica family**

Woody shrubs. Leaves mostly whorled, reduced and leathery (ericoid). Anthers opening with pores.



## **Gentianaceae**

### **Gentian family**

Opposite leaves united at the base. Petals twisted in the bud.



## **Proteaceae**

### **Protea family**

Plants woody. Flowers in heads or spikes.



## **Rubiaceae**

### **Gardenia family**

Leaves opposite with interpetiolar stipules, margins entire. Petals united into a tube. Mouth of tube usually hairy.



## **Scrophulariaceae**

(see Group 6)

### **Snagdragon family**

Herbs. Leaves opposite. Stamens mostly 4, 2 usually longer than the other, attached to the corolla.



## **Solanaceae**

### **Tomato family**

Flowers often opposite the leaves. Fruits berries or capsules.



## **Thymelaeaceae**

### **Fibre-bark family**

Tough fibrous bark. Flowers tubular, often in dense heads.





## GROUP 6

**Acanthaceae****Pistol bush family**

Opposite leaves, often on swollen nodes. Bracts conspicuous. Fruit an explosive capsule.

**Lamiaceae****Sage family**

Aromatic herbs or small shrubs. Stems 4-angled. Leaves frequently decussate.

**Lobeliaceae****Lobelia family**

Two-lipped flowers. Anthers fused into a tube.

**Orobanchaceae****Ink flower family**

Plants turn black when damaged or dried.

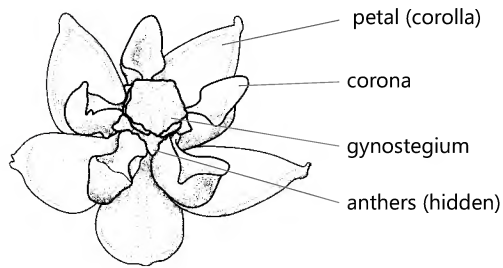
**Scrophulariaceae****Snapdragon family**

Herbs. Leaves opposite. Stamens mostly 4, 2 usually longer than the other, attached to the corolla.

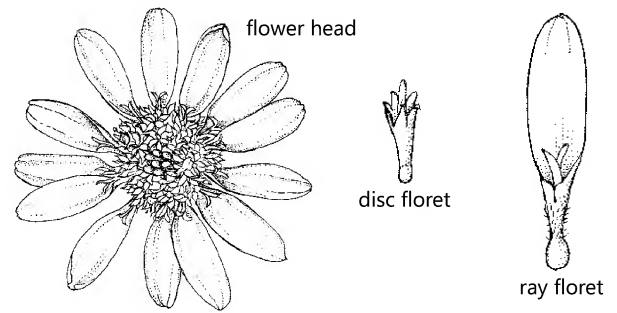


# Families with specialised flowers

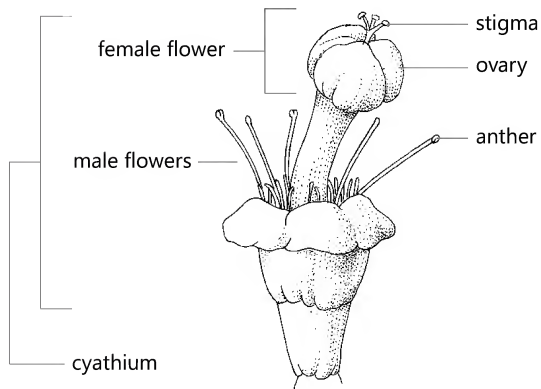
## Apocynaceae



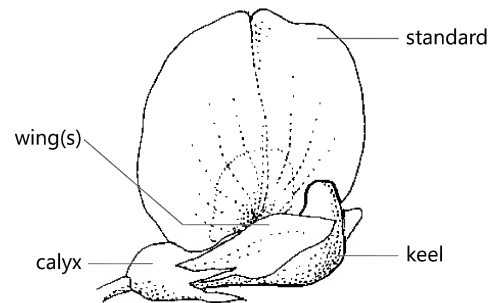
## Asteraceae



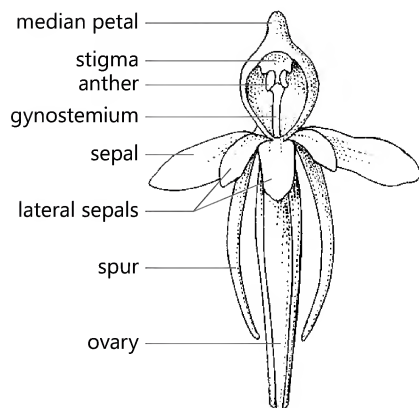
## Euphorbiaceae



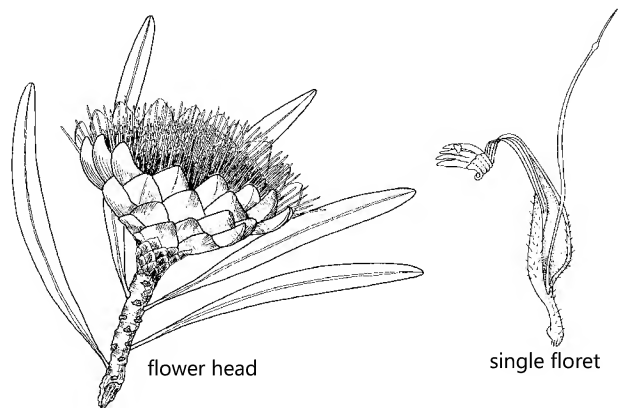
## Fabaceae (Papilionoideae)



## Orchidaceae



## Proteaceae







## Family descriptions



# CYPERACEAE

## Sedge family

Many people find it difficult to distinguish between grasses and sedges, but once you know the differences, it is quite easy. Apart from the morphological differences, there are also differences in habitat requirements.

### General information

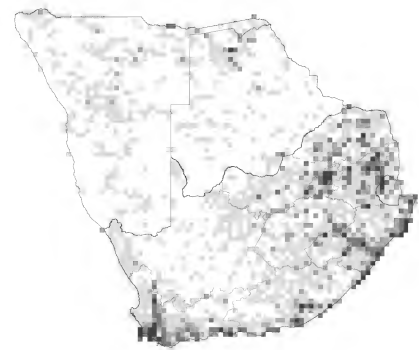
**Number of genera/species in the world:** 109/ca. 5 500.

**Number of genera/species in FSA:** 37/486.

**Well-known FSA genera:** *Carex*, *Cyperus*, *Eleocharis*, *Ficinia*, *Isolepis*, *Kyllinga*.

**Growth forms:** Grass-like herbs, usually with a perennial rhizome and often tufted.

**Habitats:** Primarily in moist or wet places but also in drier areas such as grassland and savanna.



### Distribution

A cosmopolitan family associated with moist situations. In southern Africa it is widespread with higher densities in the eastern parts of the country and along the coast to the Western Cape and Cederberg Range.

### Flagship species

*Cyperus textilis* (emezi grass, tall star sedge, basket grass; matjiesgoed [A]; umuzi [X, Z]) is quite widespread near the coasts of the Western and Eastern Cape and KwaZulu-Natal, and is often cultivated elsewhere. It grows in clumps with robust, rounded culms. Inflorescences consist of clustered spikelets subtended by a few whorls of long, flat subtending bracts. Culms are used for weaving, making sleeping mats, and were also used by the Namas to build their beehive huts (matjieshuise). It grows and spreads easily on any soil type and is ideally planted at a pond where there is enough water.



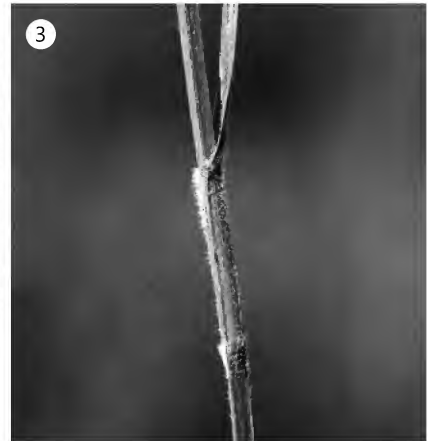
### Significance

Many Cyperaceae species are used traditionally to weave baskets, mats and other household items, build rafts and houses, for thatching and papermaking. They also play an important role in filtering water in wetland ecosystems and in stabilising the soil. Many species are cultivated and are attractive garden plants (e.g. *\*Cyperus prolifer* and *\*C. papyrus*). The fruits are a major source of food for birds and other animals.



## HOW TO IDENTIFY

Grass-like, tufted <sup>1</sup> or with rhizomes or corms. Leaves arranged in 3 ranks <sup>2</sup>, crowded at the base, linear with parallel veins, consisting of blade and sheath; sheaths are closed around the stem <sup>3</sup> and rarely split; culms 3-angled, rounded or flat, usually solid <sup>4</sup>, with or without nodes. Inflorescence at the tip of the culm or on branches clustered at the tip <sup>5</sup>, often umbellate or in heads, subtended by leaf-like bracts <sup>6</sup>. Flowers small, in a single bract <sup>7</sup>. Fruit a small nut, not splitting open <sup>8</sup>.



**DID YOU KNOW:** *Carex* is the largest genus in the family and has about 2 000 species in the world.



*Ficinia*

MK

*Carex*

MK

*Ascolepis*

MK

*Ficinia*

MK

*Cyperus*

MK

*Kyllinga*

MK

*Cyperus*

MK

*Isolepis*

MK



*Cyperus*

GN



*Bulbostylis*

MK



*Cyperus*

MK



*Ficinia*

MK



*Cyperus*

MK



*Cyperus*

GN



*Isolepis*

MK



*Scirpoides*

MK



# POACEAE

(Gramineae)

## Grass family

The virtues of grasses have been sung by many through the ages. People and animals are totally dependent on the numerous species grown as crops and fodder. It is not until you delve deeper that you start appreciating the beauty of the spikelets, their hairs, awns and their sculpturing that create the amazing differences between genera and species. In southern Africa, eight subfamilies are recognised.

### General information

**Number of genera/species in the world:** 600/9 000–10 000.

**Number of genera/species in FSA:** 200/1 016.

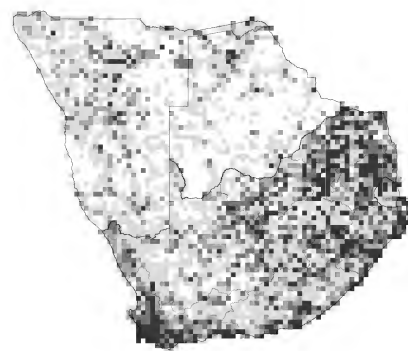
**Well-known FSA genera:** *Digitaria*, *Eragrostis*, *Panicum*, *Setaria*, *Sporobolus*, *Themeda*.

**Growth forms:** Annual or perennial herbs, usually tufted and often with a rhizome, rarely woody and tree-like (bamboo).

**Habitats:** Almost everywhere, from forest, open grassland, to the desert and the coast, on all types of soils and in all moisture conditions.

### Flagship species

The genus *Themeda* is well known despite the fact that it has only one species. *Themeda triandra* (red grass; rooigras [A]; iNsinde [Z]) is generally regarded as a desirable grass for grazing and can disappear quickly if the veld is not well managed. It is widely distributed, except in the dry areas of the Northern Cape. This distribution contributes to the very large variation in the species.



### Distribution

Grasses occur worldwide and throughout southern Africa. Locally the family has higher densities on the Highveld and in the warmer areas, but different combinations of species are found in the Western Cape.

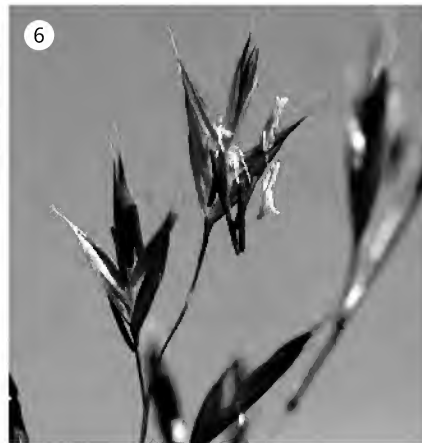
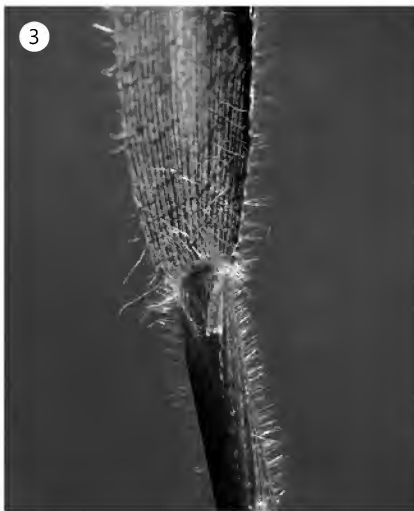
### Significance

The major importance of grasses is to provide grazing for animals and food for humans, but it has numerous other uses, for example, in horticulture as ornamentals and lawns, in the construction industry as building material, in the decorative industry as furniture and flooring, and in the textile industry as a source of fibre. Some of the more important species are: barley (*\*Hordeum vulgare*), a nutritious cereal used to produce flour and for brewing beer; rice (*\*Oryza sativa*) provides high-energy starch; sugar cane (*\*Saccharum officinarum*) is used as sweetener; maize products (*\*Zea mays*) are a staple food in many countries. Seed necklaces of *\*Coix lacryma-jobi* have traditionally been used in Zulu culture as protective charms and in teething rings for babies.



## HOW TO IDENTIFY

Herbaceous; culms usually hollow <sup>1</sup>, cylindrical or compressed, with obvious nodes <sup>2</sup> and internodes. Leaves with blades and leaf sheaths <sup>3</sup>, with ligules <sup>4</sup>. Inflorescences at the tip of the culms <sup>5</sup>. Flowers borne in spikelets <sup>6</sup>.



**DID YOU KNOW:** Three cereals (rice, wheat and maize) provide more than half of all calories consumed by humans.

## Subfamily Panicoideae

The subfamily has 71 genera and 327 species in southern Africa. It is subdivided into 5 tribes in FSA (Isachneae, Arundinelleae, Paniceae, Andropogoneae and Maydeae). Ligule a short membrane, a fringe of hairs or a fringed membrane; inflorescence a panicle or unilateral raceme; spikelets generally all alike, with 2 florets, bisexual, articulate below the glumes, lower glume shorter than the spikelet. In the tribe Andropogoneae spikelets are paired (different from each other, one often sessile and one pedicellate) and the inflorescence is usually a leafy false panicle.

Well-known FSA genera: *Alloteropsis*, *Andropogon*, *Brachiaria*, *Cenchrus*, *Cymbopogon*, *Digitaria*, *Hyparrhenia*, *Melinis*, *Panicum*, *Setaria*, *Themeda*.



*Alloteropsis*

MK



*Diheteropogon*

MK



*Brachiaria*

MK



*Andropogon*

MK





*Echinochloa* MK



*Cenchrus* MK



\**Coix* MK



*Brachiaria* MK



*Cymbopogon* MK



*Elionurus* MK



*Brachiaria* MK



*Hemarthria* MK

## Subfamily Chloridoideae

The subfamily has 51 genera and 241 species in southern Africa. It is subdivided into 2 tribes in FSA (Pappophoreae, Triodieae). Ligule membranous or a line of hairs (rarely a fringed membrane); inflorescence often with unilateral racemes, 1–many-flowered; spikelets laterally compressed, lemmas 1–3-nerved.

Well-known FSA genera: *Chloris*, *Cynodon*, *Enneapogon*, *Eragrostis*, *Pogonarthria*, *Sporobolus*, *Tragus*.



*Chloris*

MK



*Cynodon*

MK



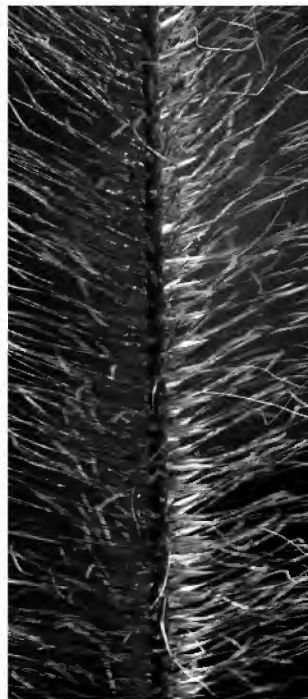
*Sporobolus*

MK



*Eragrostis*

MK



*Perotis*

MK



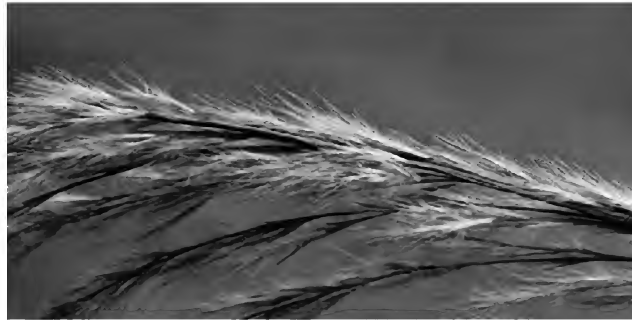
*Cladoraphis*

MK





*Enneapogon* MK



*Triraphis* MK



*Eragrostis* MK



*Fingerhuthia* MK



*Harpochloa* MK



*Stiburus* MK



*Eragrostis* MK

## Subfamily Pooideae

The subfamily has 45 genera and 144 species in southern Africa. It is subdivided into 7 tribes in FSA. Ligule membranous; inflorescence a panicle; spikelets 1–many-flowered and laterally compressed, with or without an apical or dorsal awn.

Well-known FSA genera: *Agrostis*, \**Briza*, *Bromus*, *Festuca*, *Helictotrichon*, \**Hordeum*.



*Agrostis*

MK



*Calamagrostis*

MK



*Holcus*

MK



\**Phalaris*

MK





*Bromus*

MK



*Helictotrichon*

MK



*Festuca*

MK



*\*Lagurus*

MK



*\*Thinopyrum*

MK

## Subfamily Danthonioideae

The subfamily has 11 genera and 124 species in southern Africa. Ligule a line of hairs; inflorescence a panicle; lateral and/or central awns present.

Well-known FSA genera: *Chaetobromus*, *Merxmuellera*, *Pentameris*, *Tribolium*.



*Tribolium*

MK



*Capechloa*

MK



*Merxmuellera*

MK



*Pentameris*

MK





*\*Cortaderia*

MK



*Pentameris*

MK



*Tribolium*

MK



*Capechloa*

MK

## Subfamily Aristidoideae

The subfamily has 3 genera and 79 species in southern Africa. Ligule a line of hairs; inflorescence a panicle; spikelets 3-awned, awns bare or with plumes.

Well-known FSA genera: *Aristida*, *Stipagrostis*, *Sartidia*.



*Aristida*

MK



*Stipagrostis*

MK



*Aristida*

MK



*Stipagrostis*

MK



*Stipagrostis*

MK



## Subfamily Ehrhartoideae

The subfamily has 5 genera and 43 species in southern Africa. Ligule membranous; inflorescence a panicle or unilateral raceme; spikelets often unconventional and the structure difficult to interpret.

Well-known FSA genera: *Ehrharta*, *Leersia*, *Oryza*, *Prosphytochloa*.



*Oryza*

MK



*Leersia*

MK



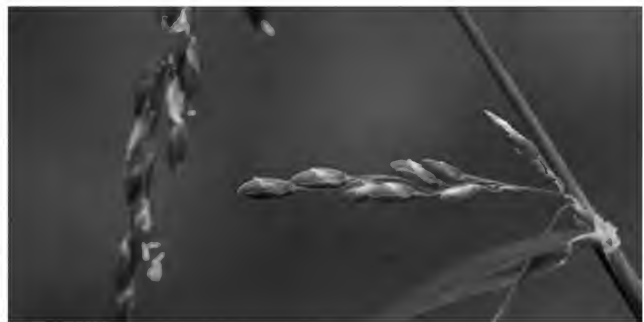
*Leersia*

MK



*Ehrharta*

MK



*Ehrharta*

MK

## Subfamily Arundinoideae

The subfamily has 5 genera and 8 species in southern Africa. Reed-like; ligule membranous with ciliate margin; inflorescence a panicle.

Well-known FSA genera: *\*Arundo*, *Phragmites*, *Dregeochloa*, *Elytrophorus*.



*\*Arundo*

MK



*Dregeochloa*

MK



*Phragmites*

MK



*\*Arundo*

MK



## Subfamily Bambusoideae

The subfamily has 4 genera and 4 species in southern Africa. Plants generally woody trees, shrubs or climbers; spikelets with 3–6 stamens and 1–3 stigmas.

Well-known FSA genera: *Thamnocalamus*, *\*Bambusa*, *Oxytenanthera*, *Olyra*.



*Thamnocalamus*

NC



*\*Bambusa*

MK



*\*Bambusa*

MK



# RESTIONACEAE

## Cape reed family

Restionaceae is one of the families that characterises the Fynbos Biome and here it largely occupies the position grasses maintain in other biomes. In South Africa it has been a sought-after building material that has been put to multiple uses, from building basic shelters in the veld, to thatching the famous Cape Dutch houses dating back to the 17th century.

### General information

**Number of genera/species in the world:** ca. 55/ca. 490.

**Number of genera/species in FSA:** 18/299.

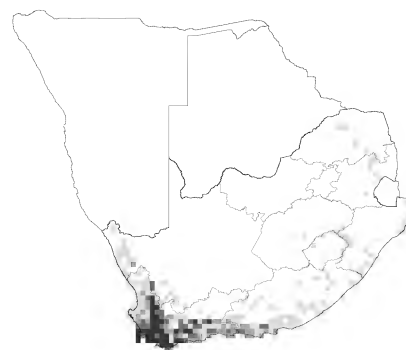
**Well-known FSA genera:** *Cannomois*, *Chondropetalum*, *Elegia*, *Hypodiscus*, *Restio*, *Rhodocoma*, *Thamnochortus*, *Willdenowia*.

**Growth forms:** Rush-like, tufted, rhizomatous or stoloniferous.

**Habitats:** Found in marshes, swamps, seasonally dry, fire-prone habitats, from sea level to altitudes of up to 2 500 m.

### Flagship species

*Cannomois virgata* (bellreed; bergbamboes, besemriet [A]) is a truly magnificent example of one of the large restio species, which can become bamboo-like and reaches up to 3 m in height. It is quite widespread in the Western and Eastern Cape where it is common on moist mountain slopes and along streams. Inflorescences of male plants can be up to 0.5 m long with hundreds of small spikelets clustered on branchlets at the nodes. Female plants have fat spindle-shaped spikelets, each bearing several large black fruits.



### Distribution

A southern hemisphere family, with most species in southwestern South Africa and western Australia. Also occurs in Chile, Madagascar, New Zealand and Malaysia.

### Significance

A number of species are extensively used for thatching. Today the main species used is *Thamnochortus insignis*, which is harvested and even cultivated in the Albertinia area of the Western Cape. It is used in thematic or waterwise gardens and has become a signature/feature plant in flower beds or potted gardens. The horticultural importance of various restio species is continuously being explored and more and more species are becoming available in the trade.



## HOW TO IDENTIFY

Grass- or rush-like <sup>1</sup>; plants usually dioecious (separate male and female plants). Stems mostly solid and circular in cross section <sup>2</sup>. Leaves mostly reduced to sheaths in older plants <sup>3</sup>; culms with abscission rings where sheaths have dropped off <sup>4</sup>; sheaths split down to the base <sup>5</sup>. Inflorescences at the tip of culms <sup>6</sup>. Flowers included in spikelets <sup>7</sup>, occasionally with conspicuous spathes. Fruit a capsule or a nut <sup>8</sup>.



**DID YOU KNOW:** Roofs thatched with high quality restios can last for up to 50 years before they need to be redone.



*Cannomois*

MK

*Staberoha*

MK

*Elegia*

MK

*Ceratocaryum*

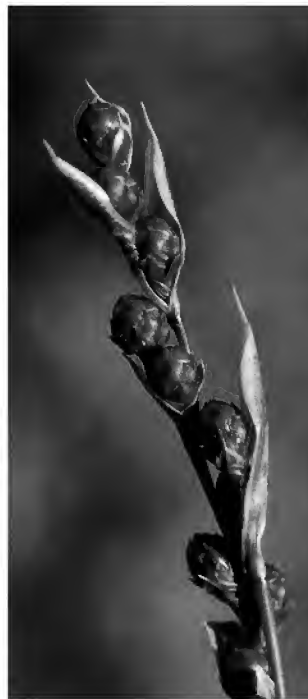
MK

*Chondropetalum*

MK

*Elegia*

MK

*Hypodiscus*

MK

*Staberoha*

MK





*Hypodiscus* MK



*Elegia* MK



*Elegia* MK



*Cannomois* MK



*Willdenowia* MK



*Nevillea* MK



*Staberoha* MK



*Rhodocoma* MK



*Elegia* MK

# ASPARAGACEAE

## Asparagus family

A small family consisting of a single genus of perennials with thick underground organs, reduced leaves and small, star-like, fragrant flowers.

### General information

**Number of genera/species in the world:** 1/ca. 120.

**Number of genera/species in FSA:** 1/88.

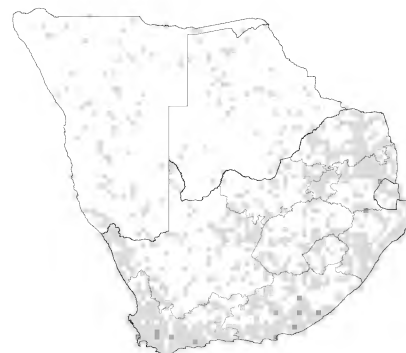
**Well-known FSA genus:** *Asparagus*.

**Growth forms:** Spiny shrubs, suffrutices or scramblers with stems arising from rhizomes, or rarely tubers.

**Habitats:** From exposed habitats on coastal plains to semi-shaded areas along forest margins; also in rocky areas in grassland and as climbers in forest.

### Flagship species

*Asparagus densiflorus* (cat's tail fern; katstert [A]; isiqobola [Z]) is a well-known garden plant all over South Africa. It is an erect to scrambling shrublet, naturally found in woodland areas. Several cultivars have been registered by plant growers. This species can easily be grown from seed or by dividing the clumps. It grows relatively fast and prefers sunny to partially shaded areas. The red berries attract birds to the garden. (Photo: GN).



### Distribution

Widely distributed throughout Africa, Europe and Asia, with a single species in Australia. Most species are found in semi-arid to arid areas, but also found in Mediterranean climate; widespread in southern Africa.

### Significance

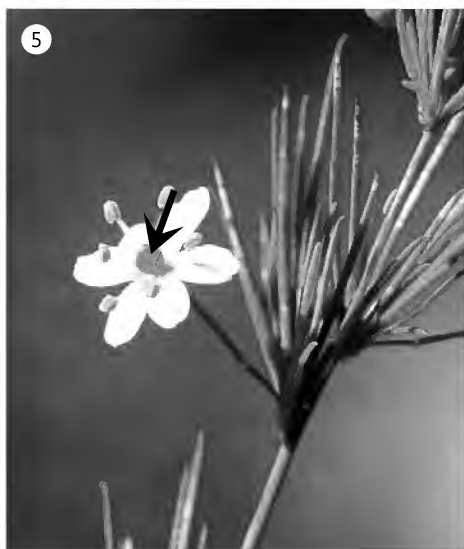
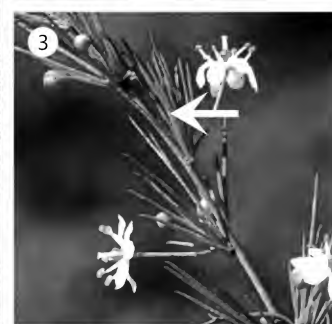
The garden asparagus (*\*Asparagus officinalis*) has been cultivated since ancient Greek times as a vegetable. Several indigenous species are known to be edible (*A. africanus*, *A. capensis*). Some species (*A. setaceus*, *A. falcatus*) are used by florists as foliage. Certain members of this group are also known as garden plants (*A. asparagoides*, *A. densiflorus*) and used in traditional medicine to treat kidney and stomach complaints, coughs and tuberculosis.





## HOW TO IDENTIFY

Compact woody base with fibrous or tuberous roots <sup>1</sup>. Leaves scale-like <sup>2</sup>, spurred at the base and subtending leaf-like phylloclades/cladodes <sup>3</sup>. Flowers star-like, regular, usually white or cream and fragrant, with 2 whorls of 3 tepals each and 2 whorls of 3 stamens each <sup>4</sup>. Ovary superior <sup>5</sup> with 3 locules. Fruit a fleshy berry <sup>6</sup> or occasionally a nutlet.



DID YOU KNOW: *Asparagus falcatus* is sometimes mistaken for young plants of the common yellowwood (*Podocarpus falcatus*).



*Asparagus*

MK

*Asparagus*

MK

*Asparagus*

MK

*Asparagus*

SPB

*Asparagus*

MK

*Asparagus*

MK

*Asparagus*

MK



*Asparagus*

MK



*Asparagus*

SPB



*Asparagus*

MK



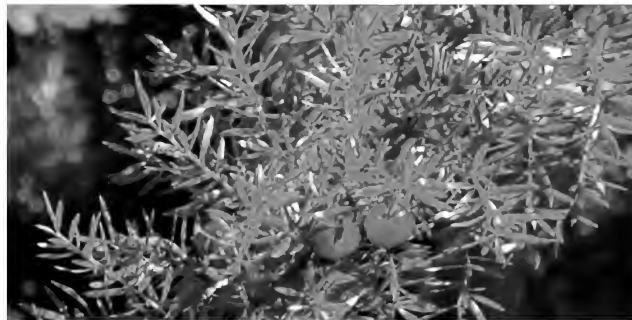
*Asparagus*

GN



*Asparagus*

SPB



*Asparagus*

HS



*Asparagus*

SPB



# ASPHODELACEAE

## Aloe family

A relatively small but widespread family of predominantly succulent herbs with a basal or terminal rosette of leaves; best known for the genus *Aloe*.

### General information

**Number of genera/species in the world:** ca. 12/ca. 900.

**Number of genera/species in FSA:** 9/635.

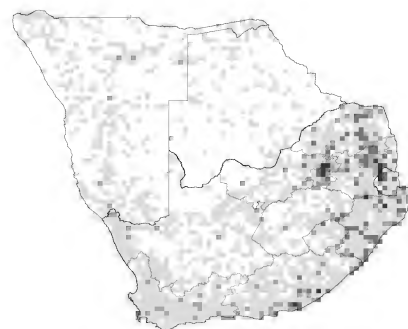
**Well-known FSA genera:** *Aloe*, *Bulbine*, *Kniphofia*.

**Growth forms:** Perennial herbs, shrubs or small to large trees, also a few geophytes and climbers; mostly with a rosette of succulent leaves.

**Habitats:** Found from arid plains to the marshy areas of high escarpment mountains.

### Flagship species

*Aloe dichotoma* (quiver tree; kokerboom [A]) is a conspicuous constituent of the vegetation of the arid parts of South Africa (Northern Cape) and Namibia. This tree aloe grows up to 9 m tall and bears beautiful yellow flowers during the winter months. The common name refers to the use of the hollowed-out stems as quivers by San hunters. Large trunks of dead trees are also hollowed out and used as natural fridges. In this tree-poor region, sociable weavers often use the quiver tree as structural support for their communal nests.



### Distribution

Widespread in arid and mesic areas of the temperate to tropical regions of the Old World, with the highest diversity in southern Africa, especially in the northeastern parts.

### Significance

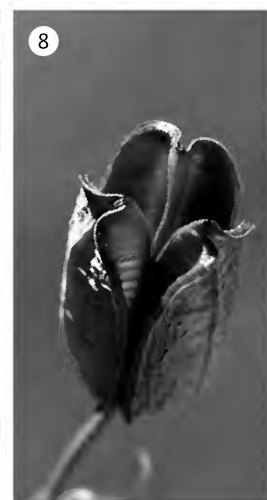
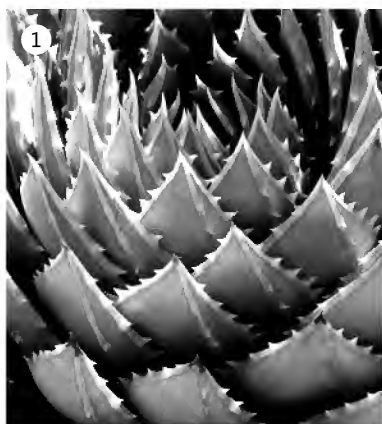
Important as garden subjects (*Aloe*, *Bulbine*, *Kniphofia*), cut flowers (*Kniphofia*) or as collector's items (*Aloe*, *Gasteria*, *Haworthia*). Members of the family (especially *Aloe* species) are known to be used medicinally as a purgative, in the treatment of arthritis, eczema, skin irritations, burns, hypertension and stress. The fleshy part of the *Aloe* leaf (aloe gel) is used in the cosmetics industry and also forms the basis of health drinks and tonics.





## HOW TO IDENTIFY

Perennials, often with swollen, tuberous roots with yellow sap. Stems, if present, fibrous and woody rather than succulent; usually with basal rosette of leaves <sup>1</sup>, mostly succulent and often with spiny margins <sup>2</sup>. Inflorescences simple or compound racemes <sup>3</sup> or spikes <sup>4</sup> on long peduncles. Flowers regular, with the perianth in 2 whorls of 3 tepals each, often united into a tube <sup>5</sup> or star-shaped <sup>6</sup>. Stamens 6, in 2 whorls of 3 each, inserted below the ovary. Ovary superior <sup>7</sup> with 3 locules. Fruit predominantly a dry loculicidal capsule <sup>8</sup>.



DID YOU KNOW: The medicinal use of *Aloe vera* (probably originating from Arabia) has been recorded from China and India about 2 400 years ago.



Aloe

GN



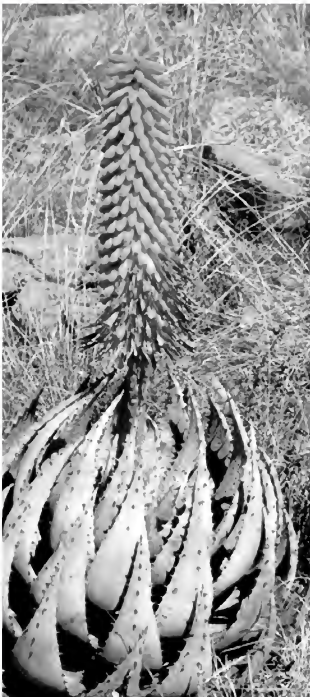
Trachyandra

MK



Haworthia

AWK



Aloe

HS



Bulbine

MK



Aloe

HS



Haworthia

JK



Bulbinella

MK



Aloe

MK





*Aloe*

MK



*Kniphofia*

SPB



*Bulbine*

MK



*Aloe*

SPB



*Aloe*

HS



*Gasteria*

AWK



*Kniphofia*

JB



*Bulbine*

MK



# COLCHICACEAE

## Colchicum family

A comparatively small family of perennial herbs with tunicated corms or rhizomes and often relatively large flowers.

### General information

**Number of genera/species in the world:** ca. 17/ca. 170.

**Number of genera/species in FSA:** 9/104.

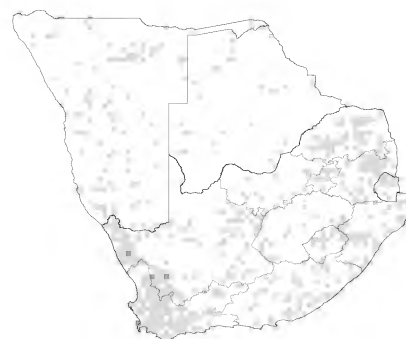
**Well-known FSA genera:** *Colchicum*, *Gloriosa*, *Wurmbea*.

**Growth forms:** Erect, sometimes twining herbs arising from corms or rhizomes, sometimes with tuberous roots.

**Habitats:** Found in arid vegetation, open scrub to forest margins, thicket and damp grassland.

### Flagship species

*Gloriosa superba* (flame lily; vlamlelie [A]; ihlamvu [Z]) is a well-known garden plant in the summer-rainfall areas of South Africa. It is a climbing plant with shiny leaves and spectacular orange and yellow flowers during late summer. Although the plant is extremely poisonous, it is used medicinally. Some of its medicinal and other uses include the treatment of barrenness, pimples, skin eruptions, tick infections and screw-worm on cattle and to kill lice. The brightly coloured seeds are used in necklaces.



### Distribution

Occurs in tropical and temperate regions of mainly the Old World. Widespread in southern Africa, especially in the Western Cape and in parts of the summer-rainfall region.

### Significance

Important as garden subjects (*Colchicum*, *Gloriosa*), cut flowers (*Gloriosa*, *Sandersonia*) or as greenhouse plants (*Sandersonia*). Members of this family are known to be used medicinally (*Gloriosa*) as well as for protection from evil (*Sandersonia*). Many members of the family contain toxic alkaloids and are poisonous to both livestock and man. They are a source of colchicine, an alkaloid used in plant breeding to create polyploids. (Photo: NC).



## HOW TO IDENTIFY

Geophytes with starch-rich corms <sup>1</sup> or rhizomes. Leaves alternate, sessile, sheathing at the base <sup>2</sup>, sometimes on long trailing stems <sup>3</sup>. Flowers borne in terminal racemes or cymes, mostly regular with perianth in 2 whorls of 3 tepals each <sup>4</sup>. Stamens in 2 whorls of 3 each <sup>5</sup>. Ovary superior <sup>6</sup> with 3 locules; styles 3, sometimes joined at the base. Fruit a dry, or somewhat fleshy, septicidal or loculicidal capsule <sup>7</sup>.



**DID YOU KNOW:** The flowers of *Colchicum* species produce a reasonable amount of nectar and are pollinated by rodents.

*Colchicum*

MK

*Ornithoglossum*

JV

*Gloriosa*

NC

*Sandersonia*

GN

*Wurmbea*

JV

*Ornithoglossum*

MK





*Hexacyrtis*

SS



*Colchicum*

MK



*Gloriosa*

MK



*Colchicum*

SPB



*Wurmbea*

GN



*Ornithoglossum*

MK



*Colchicum*

JK

# ERIOSPERMACEAE

## Eriospermum family

A monotypic family of perennial, geophytic herbs with underground tubers (potato-like structures). Most species, particularly in the winter-rainfall regions, develop leaves and flowers at different times (hysteranthous).

### General information

**Number of genera/species in the world:** 1/ca. 118.

**Number of genera/species in FSA:** 1/118.

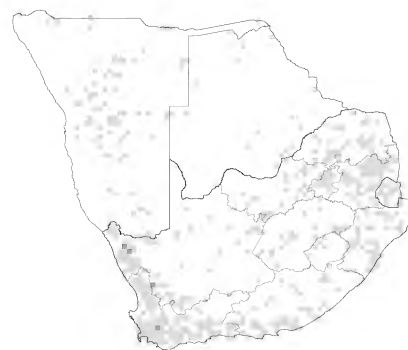
**Well-known FSA genus:** *Eriospermum*.

**Growth forms:** Perennial tuberous geophytes.

**Habitats:** Found in arid and semi-arid areas and grassland.

### Flagship species

*Eriospermum mackenii* (yellow fluffy-seed; perdepootjie [A]; insulansula [Z]) is always entirely glabrous and is widely distributed in KwaZulu-Natal and the northern provinces. Leaves and flowers are present at the same time and 2–5 large egg-shaped leaves are produced from a tuber. In traditional folklore, this species is used to ward off lightning. The tuber is edible. This species is reported to grow well in cultivation. (Photo: GN).



### Distribution

Found from sub-Saharan Africa with the highest diversity of species in the Western Cape in South Africa. Many local endemics occur in Namibia and the Cape provinces.

### Significance

Tubers of some *Eriospermum* species are eaten as a vegetable and are used for various medical remedies by different ethnic groups. Some species have been cultivated in the past, but mostly out of curiosity rather than for economic purposes. Plants in cultivation do well as garden subjects. (Photo: NC).



## HOW TO IDENTIFY

Tuberous geophytes <sup>1</sup>. Inflorescence an erect, scapose, few- to many-flowered raceme <sup>2</sup>. Flowers bisexual with 6 petal-like structures (tepals) in 2 whorls fused at the base, either similar or the outer whorl spreading and the inner erect. Stamens 6, attached to the tepals <sup>3</sup>. Ovary superior <sup>4</sup>, 3-locular. Fruit a loculicidal capsule <sup>5</sup> with 6–12 seeds. Seeds covered with long hairs resulting in a 'woolly' or 'cotton-like' appearance <sup>6</sup>. (Photo <sup>3</sup>: NC).

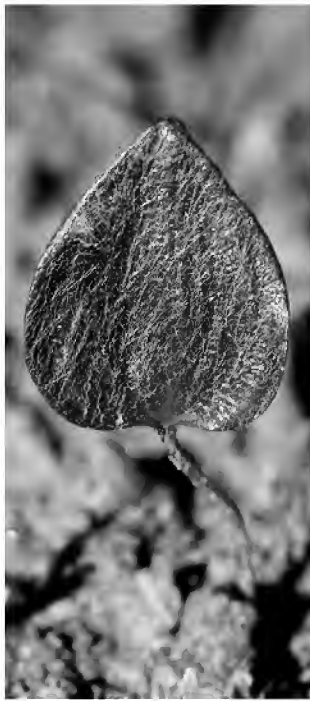


**DID YOU KNOW:** *Eriospermum* is the only genus in this monotypic family, which makes it a monotypic family.



*Eriospermum*

JK

*Eriospermum*

SPB

*Eriospermum*

SPB

*Eriospermum*

EE

*Eriospermum*

JK



*Eriospermum*

JK



*Eriospermum*

MK



*Eriospermum*

JK



*Eriospermum*

SPB



*Eriospermum*

NC



*Eriospermum*

JK



*Eriospermum*

SPB



# HYACINTHACEAE

## Chincherinchee family

A family of perennial bulbous herbs, with basal leaves, slimy sap and variously coloured flowers. Many species are important cultivated plants.

### General information

**Number of genera/species in the world:** ca. 46/ca. 900.

**Number of genera/species in FSA:** 21/535.

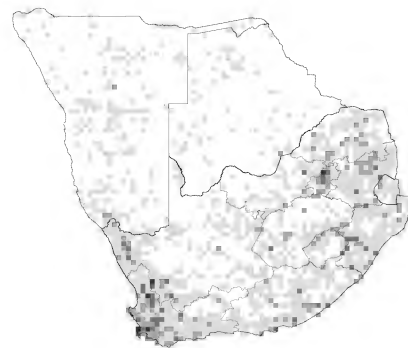
**Well-known FSA genera:** *Albuca*, *Eucomis*, *Lachenalia*, *Ornithogalum*.

**Growth forms:** Perennial, bulbous herbs.

**Habitats:** Mostly found in open, sunny habitats from sea level to mountaintops.

### Flagship species

*Eucomis autumnalis* (pineapple flower; wildepynappel [A]; ubuhlungu becani [X]; umathunga [Z]) is a well-known indigenous garden plant. It is a summer-growing, deciduous plant with a basal rosette of leaves appearing in spring. The flower stalk bears up to 125 flowers with a tuft of leaves (bracts) at the top. Pineapple flowers are especially attractive when planted in groups. Although the bulb is toxic, this plant is popular in the medicinal plant trade to treat respiratory and urinary problems, flatulence, stomach ache, fevers, syphilis and to facilitate childbirth.

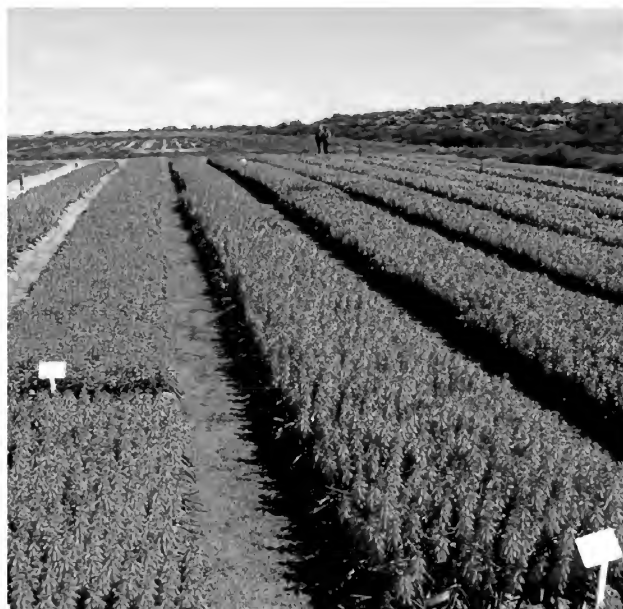


### Distribution

Widely distributed globally with the highest diversity in southern Africa and the Mediterranean, extending into Asia. In southern Africa, most species are found in the winter-rainfall areas and in the eastern parts of the summer-rainfall areas.

### Significance

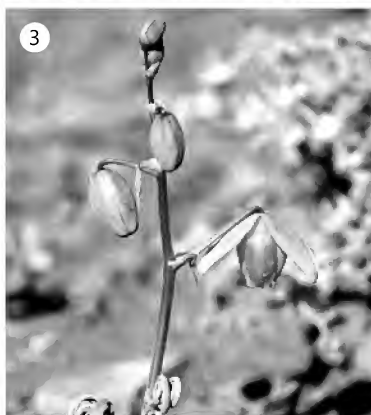
Many species are important as cultivated plants in gardens and parks (*Eucomis*, *\*Hyacinthus*, *Veltheimia*), as cut flowers (*Ornithogalum*) and pot plants (*Lachenalia*). Some genera are known to have medicinal value (*Bowiea*, *Drimia*). *\*Drimia maritima* has been used since 1554 BC as a cure for dropsy. In southern Africa, certain species of *Ledebouria* were occasionally used as food plants by the San. Some *Ledebouria*, *Ornithogalum* and *Drimia* species are poisonous to livestock.





## HOW TO IDENTIFY

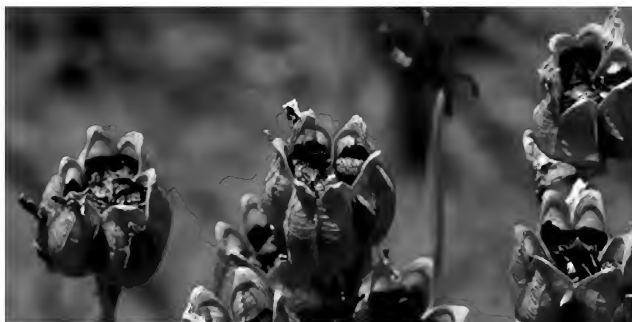
Bulbous perennials <sup>1</sup> with basal rosette of mostly channelled leaves, appearing with the flowers <sup>2</sup>. Inflorescences racemes or spikes borne on leafless stems <sup>3</sup>. Flowers mostly regular, with 2 whorls of 3 tepals each <sup>4</sup> and 2 whorls of 3 stamens each <sup>5</sup>. Ovary superior <sup>6</sup> with 3 locules. Fruit a loculicidal capsule <sup>7</sup>.



**DID YOU KNOW:** The climbing onion (*Bowiea volubilis*) was recently classified as vulnerable due to plant harvesting for traditional medicinal use.

*Lachenalia*

MK

*Albuca*

MK

*Merwillia*

SPB

*Ornithogalum*

MK

*Eucomis*

MK

*Ornithogalum*

JK

*Whiteheadia*

MK

*Lachenalia*

MK

*Drimia*

MK





*Albuca*

MK



*Lachenalia*

SPB



*Dipcadi*

MK



*Eucomis*

JK



*Veltheimia*

SPB



*Merwillia*

MK



*Ledebouria*

SPB



*Albuca*

JK



# AMARYLLIDACEAE

(excluding Agapanthaceae and Alliaceae)

## Clivia family

The family Amaryllidaceae consists of bulbous plants that are widely cultivated for horticultural purposes. The leaves are frequently distichous and strap-shaped to linear. The inflorescences are scapose (borne on a leafless stalk) with the flowers arranged in an umbel-like cluster.

### General information

**Number of genera/species in the world:** ca. 60/ca. 800.

**Number of genera/species in FSA:** 20/266.

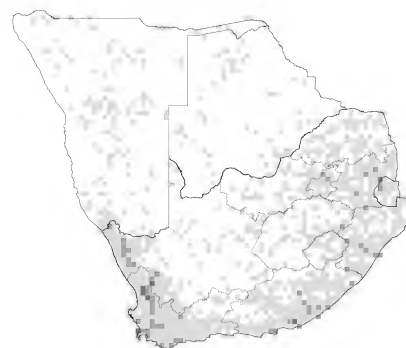
**Well-known FSA genera:** *Ammocharis*, *Boophone*, *Brunsvigia*, *Clivia*, *Crinum*, *Cyrtanthus*, *Gethyllis*, *Haemanthus*, *Nerine*, *Scadoxus*.

**Growth forms:** Herbaceous, perennial or biennial, bulbous or rarely rhizomatous (*Scadoxus*).

**Habitats:** Grassland, savanna and wetlands. Many taxa are adapted to dry habitats.

### Flagship species

*Crinum macowanii* (river lily; rivierlelie [A]; umnduze [Z]) grows almost up to 1 m tall, has lovely large, trumpet-shaped, white and pink-striped flowers which are pleasantly scented. This plant is used as a traditional medicine for treating urinary infections and the relief of itchy rashes. Various parts are used as bandages and according to folklore even as protective charms. In gardens it can be used with success as a focus plant and even when not flowering the leaves are quite attractive. (Photo: GN).



### Distribution

Found mainly in warm temperate and tropical regions. The centres of diversity are South America, southern Africa and the Mediterranean. In southern Africa the highest diversity is in the Western Cape and along the West Coast through Namaqualand to southern Namibia.

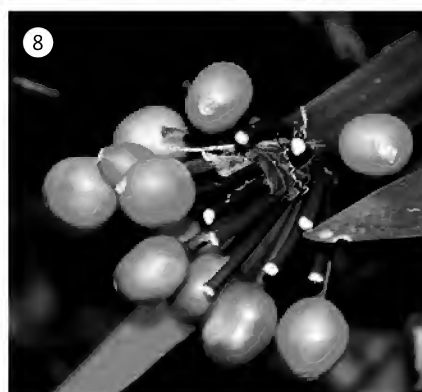
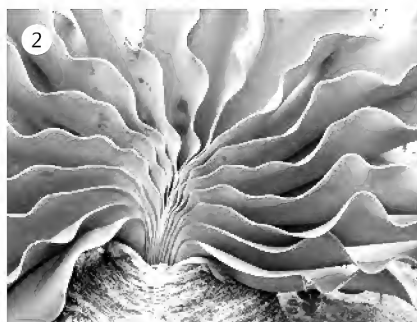
### Significance

The family is renowned for its use in horticulture. Many species are large-flowered and are cultivated for the cut flower industry. Some genera have a potential for medicinal use due to their anticancer properties. The mashed bulbs or fibrous tunic layers are used as dressings to heal wounds and for skin and digestive disorders. The fruits of *Gethyllis*, commonly known as kukumakranka, are used as flavourants and perfumes. The bulbs of many amaryllids are toxic to pets like cats and dogs; symptoms of poisoning may include vomiting, salivation and diarrhoea.



## HOW TO IDENTIFY

Mostly geophytes with bulbs <sup>1</sup>. Leaves narrowly to broadly strap-shaped, or elliptical, mostly in 2 rows <sup>2</sup>, usually glabrous. Inflorescence an umbel-like cluster at the end of a leafless stalk (scape) <sup>3</sup>. Flowers regular <sup>4</sup>, mostly supported by 2 or rarely up to 8 bracts <sup>5</sup>. Perianth in 2 whorls of 3 tepals each, usually showy <sup>6</sup>. Anthers 6, in 2 whorls of 3 each. Ovary inferior <sup>7</sup>, sometimes visible as thickening at base of a long tube, 3-locular. Fruit a capsule (with dry or fleshy seeds) or a fleshy berry <sup>8</sup>.



**DID YOU KNOW:** *Clivia* is a widely cultivated genus and some cultivars fetch the highest prices for any amaryllid in the world.



*Nerine*

MK

*Cyrtanthus*

MK

*Haemanthus*

MK

*Scadoxus*

HS

*Boophone*

MK

*Clivia*

GN

*Scadoxus*

GN

*Amaryllis*

SPB





*Gethyllis*

RDV



*Nerine*

HS



*Crinum*

GN



*Cyrtanthus*

SPB



*Brunsvigia*

SPB



*Crinum*

SPB



*Scadoxus*

SPB



*Ammocharis*

GN

# HYPOXIDACEAE

## Star lily family

The family is relatively small with six of its nine genera occurring in southern Africa. In this region, *Hypoxis* is by far the largest genus. The species are usually among the first to flower and the bright yellow star-like flowers are always a delight to see in a burnt veld after the winter. They flower for quite a long period and contribute to flower displays throughout the season.

### General information

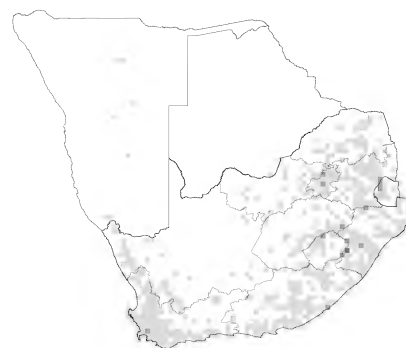
**Number of genera/species in the world:** 9/130.

**Number of genera/species in FSA:** 6/87.

**Well-known FSA genera:** *Empodium*, *Hypoxis*, *Rhodohypoxis*, *Spiloxene*.

**Growth forms:** Herbs with tuberous rhizomes or corms.

**Habitats:** Rocky habitats, open grassland, often around water or moist areas.



### Distribution

Although the family is widespread in South America, Australia and tropical Asia, it is most diverse in southern Africa where 5 of the 6 genera are endemic. Locally it occurs in Namaqualand and Western Cape as well as in the eastern part of the country; usually associated with grassland and often with moist or seasonally moist areas.

### Flagship species

*Hypoxis hemerocallidea* (African potato; sterblom [A]; inkomfe [Z]) is quite common in the eastern part of the country and is often found in large stands. The leaves and bright yellow star-shaped flowers make this a very attractive plant. Leaves are long, strap-shaped, slightly hairy and deeply v-shaped in cross section. Leaves grow in three directions from a large tuberous corm, which give a characteristic triangular appearance to the plants. The tubers are used in African traditional medicine to treat various ailments and were recently recognised for their immune-boosting and anti-inflammatory properties. They contain sterols and sterolins.



### Significance

Tablets, capsules, creams or infusions of *Hypoxis hemerocallidea* (also marketed under the older name, *H. rooperii*) are commercially available. This species has traditionally been used to treat many ailments related to diabetes, blood loss, endometriosis, PMS, arthritis, cancer and viral infections. Several *Hypoxis* species will make very attractive garden plants, but it is *Rhodohypoxis baurii* and *R. milloides*, which are most widely cultivated. These are miniature plants with pink or white star-flowers. *Rhodohypoxis baurii* and its cultivars are popular container plants in Europe, Japan, Australia and New Zealand.





## HOW TO IDENTIFY

Geophytes with vertical tuberous rhizomes or corms <sup>1</sup>. Leaves basal, arranged in 3 ranks <sup>2</sup>, with parallel longitudinal grooves, sometimes pleated; old leaf bases fibrous <sup>3</sup>. Flowers regular <sup>4</sup>, borne on leafless stalks; perianth in 2 whorls of 3 tepals each, yellow, white or pink <sup>5</sup>, greenish on the outside and persistently hairy. Stamens 6, in 2 whorls of 3 each, rising from base of flower on short filaments <sup>6</sup>. Ovary inferior; style short.



 DID YOU KNOW: Several *Hypoxis* species contain toxic substances in the unprocessed or raw form.



*Empodium*

JK

*Rhodohypoxis*

MK

*Hypoxis*

MK

*Spiloxene*

MK

*Hypoxis*

MK

*Rhodohypoxis*

MK

*Hypoxis*

MK

*Rhodohypoxis*

MK

*Hypoxis*

MK



*Spiloxene*

MK



*Hypoxis*

MK



*Hypoxis*

MK



*Hypoxis*

MK



*Hypoxis*

MK



*Rhodohypoxis*

MK



# IRIDACEAE

## Gladiolus family

A geophytic family of perennial evergreen or deciduous herbs with attractive, colourful flowers, usually with contrasting markings. Well-known as horticulturally important plants, including ornamentals and cut flowers.

The division into subfamilies is based on a series of morphological specialisations. Only four of the subfamilies are represented in southern Africa.

### General information

**Number of genera/species in the world:** ca. 70/ca. 1 800.

**Number of genera/species in FSA:** 33/1 204.

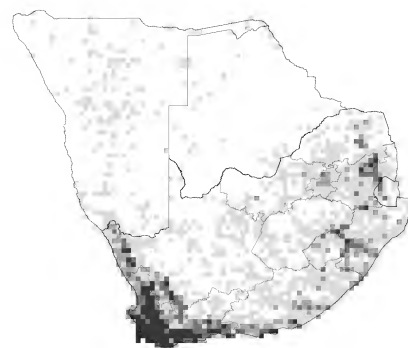
**Well-known FSA genera:** *Freesia*, *Gladiolus*, *Watsonia*.

**Growth forms:** Mostly deciduous perennial herbs with rhizomes, corms or rarely bulbs; seldom shrubs.

**Habitats:** Mostly found in open scrub, grassland and arid vegetation with a few species favouring forest and forest margins.

### Flagship species

*Moraea fugax* (wituintjie [A]) is a well-known plant from the sandy coastal areas of Namaqualand. The short-lived, white (occasionally also blue or yellow) flowers are pleasantly scented and the corms were (sometimes still are) eaten by the local people. They are either skinned and boiled in milk or roasted in hot ash. According to people who regularly ate these corms, they taste almost like potatoes.



### Distribution

Occurring in tropical and temperate regions with an especially high diversity in the winter-rainfall areas of South Africa; also common along the eastern escarpment.

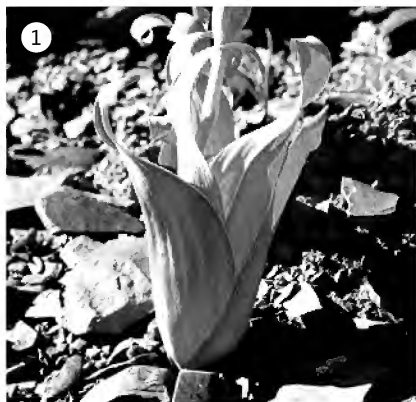
### Significance

Very important in the cut flower industry (*Freesia*, *Gladiolus*) and as garden subjects (*Chasmanthe*, *Crocasmia*, *Dietes*, *Watsonia*). Corms of certain members of the family are used as food, especially in Africa. Stigmas of *\*Crocus sativus* are the source of the spice saffron, which is commercially grown in Europe and the Middle East. These stigmas are picked from each flower by hand; 454 g of dry saffron requires 50 000–75 000 flowers, making it the world's most expensive spice. Some *Moraea* species are poisonous to grazing animals.



## HOW TO IDENTIFY

Perennials with rhizomes, corms or bulbs. Leaves sword-shaped in 2 ranks (distichous) <sup>1</sup>, usually forming a fan and appearing with the flowers <sup>2</sup>. Inflorescences either clusters of cymes or spikes and usually borne on leafy stems <sup>3</sup>. Flowers mostly regular with the perianth in 2 whorls of 3 tepals each <sup>4</sup>, often united into a tube <sup>5</sup>. Stamens 3, situated opposite the outer tepals <sup>6</sup>. Ovary inferior <sup>7</sup> with 3 locules. Fruit a loculicidal capsule <sup>8</sup>.



**DID YOU KNOW:** In many genera a long perianth tube is characteristic—an adaptation to pollination by long-tongued flies, birds or moths.



## Subfamily Crocoideae

Mainly deciduous herbs; rootstock a tunicated corm. Inflorescences are spikes (sometimes 1-flowered) of sessile, mostly irregular, variously coloured flowers, lasting at least two days, with a distinct perianth tube and subtended by a pair of bracts; style branches are distinct and slender; floral nectaries are septal.

Well-known FSA genera: *Babiana*, *Chasmanthe*, *Dierama*, *Gladiolus*, *Romulea*, *Sparaxis*, *Watsonia*.



*Dierama*

MK



*Tritonia*

SPB



*Freesia*

MK



*Watsonia*

MK



*Dierama*

MK



*Ixia*

JK



*Lapeirousia*

SPB



*Xenoscapa*

SPB



*Lapeirousia*

MK



*Lapeirousia*

MK



*Gladiolus*

GN



*Romulea*

MK



*Gladiolus*

SPB



*Hesperantha*

MK



*Chasmanthe*

HS



*Babiana*

HS



*Romulea*

MK



*Dierama*

SPB



*Watsonia*

MK



## Subfamily Iridoideae

Deciduous or evergreen herbs; rootstock a rhizome or a corm. Rhipidia (umbel-like cymes) not united in pairs, enclosed in opposite spathe-like bracts. Flowers stalked, regular, short-lived, variously coloured, each subtended by a single bract, usually with free tepals; style deeply lobed, with branches often elaborate, petal-like; floral nectaries on tepals.

Well-known FSA genera: *Bobartia*, *Dietes*, *Ferraria*, *Moraea*.



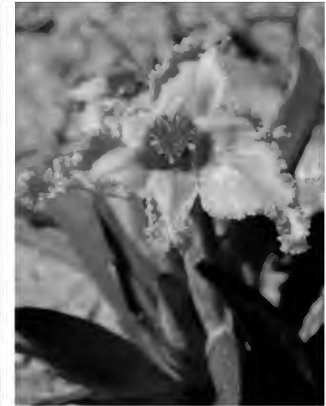
*Moraea*

MK



*Bobartia*

MK



*Ferraria*

JK



*Ferraria*

HS



*Moraea*

MK



*Moraea*

SPB



*Moraea*

MK



*Moraea* MK



*Dietes* SPB



*Bobartia* MK



*Ferraria* SPB



*Dietes* SPB



*Moraea* MK



*Ferraria* SPB



*Moraea* MK



## Subfamily Aristeoideae

Evergreen herbs; rootstock a rhizome. Inflorescence consisting of paired rhipidia, enclosed in opposite spathe-like bracts. Flowers stalked, regular, short-lived, mostly blue, each subtended by a single bract, with tepals  $\pm$  free; style notched or lobed; nectaries mostly absent.

Well-known FSA genus: *Aristea*.



*Aristea*

RDV



*Aristea*

HS



*Aristea*

MK



*Aristea*

MK



*Aristea*

MK



*Aristea*

MK



*Aristea*

MK

## Subfamily Nivenioideae

Evergreen shrubs with woody aerial stems; rootstock a woody caudex. Inflorescence consisting of paired rhipidia, enclosed in opposite spathe-like bracts. Flowers sessile, regular, lasting at least two days, each subtended by a single bract, with tepals united in a tube; style notched or with 3 slender branches; floral nectaries are septal.

Well-known FSA genera: *Klattia*, *Nivenia*, *Witsenia*.



*Nivenia*

JV



*Nivenia*

JV



*Nivenia*

MK



*Nivenia*

JV



*Nivenia*

MK



*Nivenia*

JV



# ORCHIDACEAE

## Orchid family

A family with highly specialised flowers, adapted for insect pollination. Fruits contain thousands of seeds that are so small that they appear dust-like when dispersed by the wind. The family is cosmopolitan and has many uses apart from their attractive, colourful flowers used in the flower industry.

### General information

**Number of genera/species in the world:** ca. 800/ca. 20 000.

**Number of genera/species in FSA:** 53/529.

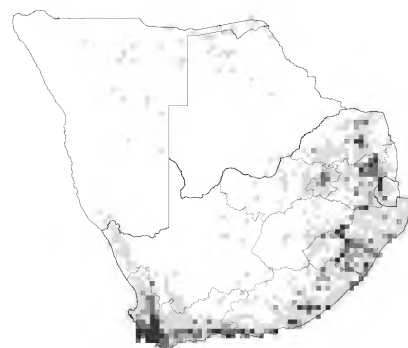
**Well-known FSA genera:** *Bonatea*, *Brownleea*, *Corycium*, *Disa*, *Eulophia*, *Habenaria*, *Holothrix*, *Mystacidium*, *Polystachya*, *Satyrium*.

**Growth forms:** Terrestrial, epilithic or epiphytic, very rarely a climber (e.g. *Vanilla*). Mostly deciduous perennial herbs, with rhizomes, corms, tuberous roots or pseudobulbs.

**Habitats:** Bushveld, savanna, karroid and thorn scrub, fynbos and grassland; often associated with wetlands.

### Flagship species

*Disa uniflora* (red disa; rooidisa [A]) grows along stream banks and in moist places and makes a spectacular display when in full bloom during the summer months. This species is one of the best known South African orchids and the floral emblem of the Western Cape. The red disa has been grown in England at least since 1891 and is the parent to many hybrids cultivated by orchid growers. The flowers are usually red but can vary from pink to yellow and even white. It is also cultivated in New Zealand as a cut flower. (Photo: RO).



### Distribution

Cosmopolitan, distributed from the tropics to the subarctic zone. Infrequently found in dry areas or high altitudes. Southern Africa has high levels of diversity in the Western Cape and along the Drakensberg escarpment.

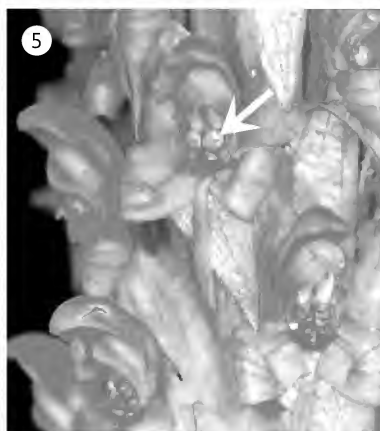
### Significance

The main economic importance of the family is in the flower industry as ornamentals and long-lasting cut flowers. The Mexican species *\*Vanilla planiflora* has long been cultivated for the aromatic flavour of its pods (beans). The tubers of some African species (e.g. *Satyrium*) are harvested as a food source. A large number of species are used in traditional medicines. Various parts of orchids are used in traditional folklore in Africa as love, death and fertility charms, to ward off evil or as protection from lightning. Some species are also used as aphrodisiacs. (Photo: RDV).



## HOW TO IDENTIFY

Herbs usually with rhizomes, pseudobulbs <sup>1</sup> or tubers <sup>2</sup>. Leaves alternate, usually basal, spirally arranged or in 2 rows <sup>3</sup> with parallel veins. Flowers irregular <sup>4</sup> with complex structure. Androecium and gynoecium fused into a gynandrium <sup>5</sup>. Calyx consists of 3 sepals, green or coloured. Corolla consists of 3 petals, lower one modified into a lip <sup>6</sup>. Stamens not visible and highly modified and fused with style to form a column. Pollen aggregated into a waxy clump to form pollinia, sometimes covered by anther caps <sup>7</sup>. Ovary inferior <sup>8</sup>, 1-locular with 3 carpels. Fruit a capsule <sup>9</sup> with numerous minute seeds.



**DID YOU KNOW:** The Orchidaceae is one of the largest flowering plant families and, in addition to the natural species, more than 70 000 cultivars and hybrids have been cultivated from this family.



*Disperis*

MK

*Disa*

SPB

*Eulophia*

SPB

*Bonatea*

MK

*Eulophia*

SPB

*Brachycorythis*

SPB

*Satyrium*

SPB

*Disa*

MK

*Eulophia*

MK



*Holothrix*

SPB



*Satyrium*

JB



*Disa*

MK



*Disa*

MK



*Bonatea*

SPB



*Mystacidium*

JB



# AIZOACEAE

(excluding Mesembryanthemaceae)

## Kraalbos family

This is a relative small family found mainly along the coastal areas of the tropics. About half of all species in the family belong to the genus *Tetragonia*.

### General information

**Number of genera/species in the world:** ca. 12/ca. 174.

**Number of genera/species in FSA:** 10/106.

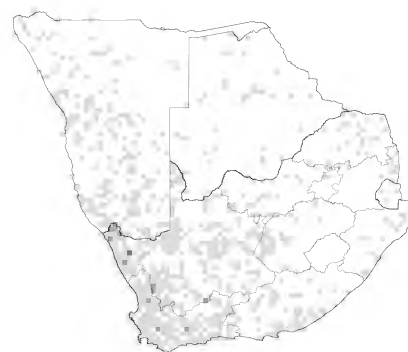
**Well-known FSA genera:** *Aizoon*, *Galenia*, *Sesuvium*, *Tetragonia*, *Trianthema*.

**Growth forms:** Annual herbs to perennial, woody shrubs, mostly somewhat succulent.

**Habitats:** Mostly in sandy coastal vegetation and dry to arid inland plains.

### Flagship species

*Tetragonia decumbens* (dune spinach; duinespinasie [A]) is a spreading shrub with dark green, somewhat succulent leaves, small yellow flowers and thick 4-winged fruit. This species is ecologically important in stabilising coastal dunes and is widely used for rehabilitation of coastal areas. Young growth is washed, cooked and eaten as spinach. Through appropriate selection it has potential to develop into an economical crop similar to the New Zealand spinach, *\*T. tetragonioides*. (Photo: JF).



### Distribution

Grows in the tropics and subtropics extending into dry, warm, temperate Africa, Asia and North America with a centre of diversity in Africa. In southern Africa the highest diversity is along the West Coast from the Western Cape through Namaqualand to southern Namibia.

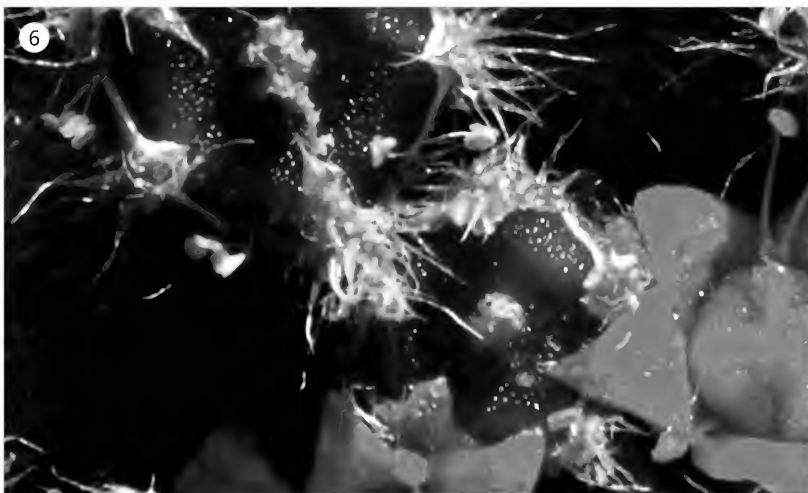
### Significance

*Tetragonia tetragonioides* has limited use as a leaf vegetable but is a noxious invasive weed in many areas of the world. Some species are used in ecological rehabilitation for binding sand dunes in coastal regions.



## HOW TO IDENTIFY

Leaves alternate <sup>1</sup>, opposite or in whorls with or without stipules. Flowers small, regular <sup>2</sup>; corolla much reduced or absent. Anthers 4 to numerous, usually free <sup>3</sup>. Calyx persistent, with 4 or 5 lobes <sup>4</sup>. Styles usually 2 or more, free <sup>5</sup>. Ovary inferior or superior. Fruit a capsule <sup>6</sup>.



DID YOU KNOW: *Galenia africana*, a pioneer from Namaqualand, is often not only the first perennial to establish in disturbed veld, but frequently the last to survive in overgrazed situations.



*Tetragonia*

MK

*Trianthema*

SPB

*Tetragonia*

SPB

*Trianthema*

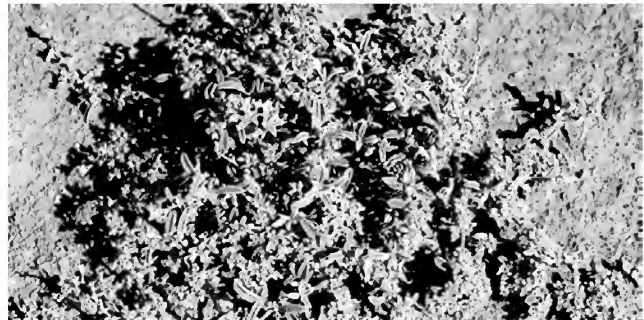
SPB

*Aizoon*

HV

*Sesuvium*

SPB

*Galenia*

SPB

*Aizoon*

MK



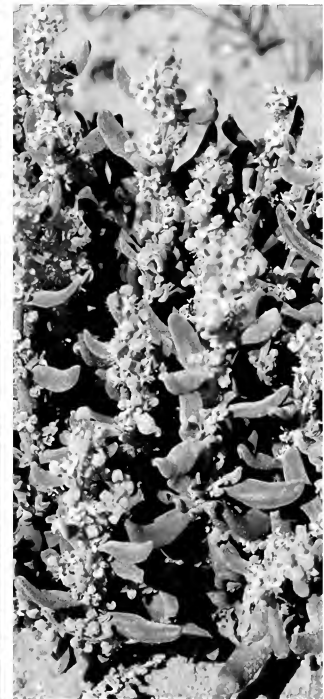
*Sesuvium*

MK



*Aizoon*

GN



*Tetragonia*

SPB



*Tetragonia*

SPB



*Aizoon*

MK



# AMARANTHACEAE

(excluding Chenopodiaceae)

## Amaranth family

The family includes several cosmopolitan weeds in disturbed areas and agricultural fields. It is better known for its important exotic vegetable and grain crops and a few decorative species than for the species indigenous to southern Africa.

### General information

**Number of genera/species in the world:** ca. 69/ca. 1 000.

**Number of genera/species in FSA:** 24/84.

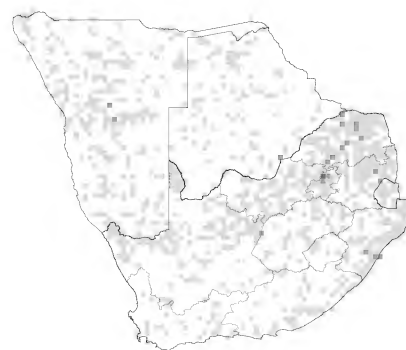
**Well-known FSA genera:** *Amaranthus*, *Calicorema*, \**Guilleminea*, *Hermbstaedtia*, *Sericocoma*.

**Growth forms:** Mostly annual or perennial herbs or small shrubs with a woody base. The indigenous species are often xerophytic.

**Habitats:** The indigenous species often grow in dry, sandy areas, whilst the cosmopolitan species are mostly found in weedy situations in cultivated or disturbed areas.

### Flagship species

*Hermbstaedtia odorata* (cat's tail; rooiaarbossie [A]; ubuphuphu [Z]) is widespread in grassland areas and flowers in summer. Plants are 300–600 mm tall with long narrow leaves. Numerous stems are produced from a perennial rootstock, bearing white, red or pink flowers in spike-like inflorescences. In Botswana the plants are used medicinally to treat depressed fontanelle in babies and gonorrhoea in adults. (Photo: HV).



### Distribution

A widespread and cosmopolitan family of the subtropical and tropical regions in America and Africa. Many of the indigenous southern African species are restricted to the drier, warmer summer-rainfall areas of the country.

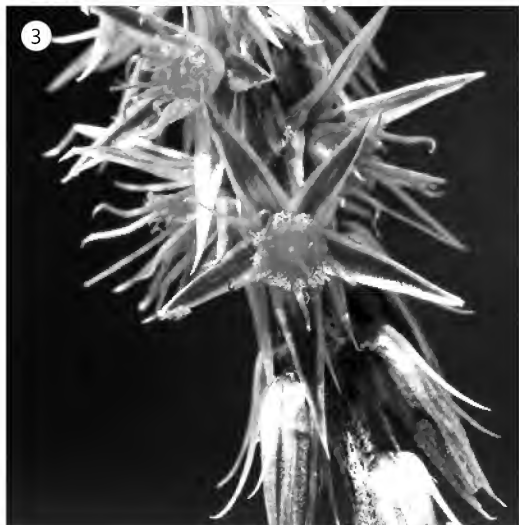
### Significance

The seeds of amaranth species, e.g. Inca wheat (\**Amaranthus cruentus*) are edible and used as cereals or ground for flour and porridge. Seeds are high in protein and have become a popular health food. As a vegetable crop, *Amaranthus* is one of the highest yielding and most nutritious crops in the tropics where the leaves of several species are used as a potherb. In South Africa there are even some commercial plantings and the vegetative parts (marogo) are canned. Some species are eaten like spinach, as green vegetable or in salads, e.g. Chinese and duck's spinach (\**Amaranthus tricolor*, \**A. viridis*). A few species are weedy, and a number of species are popular garden ornamentals, e.g. cockscomb (\**Celosia*).



## HOW TO IDENTIFY

Leaves alternate or opposite <sup>1</sup>, stipules absent. Flowers very small, regular, and in spike-like structures surrounded by dry, often spiny, bracts <sup>2</sup>. Sepals 5, free, dry and membranous <sup>3</sup>. Filaments united into a short tube at the base <sup>4</sup>. Fruit dry, opens with a lid.



**DID YOU KNOW:** Amaranth seeds are gluten-free and the seeds of some species can be puffed and popped like popcorn.



*Cyathula*

GN

*Hermbstaedtia*

MK

*Calicorema*

MK

*Kyphocarpa*

MK

*Sericorema*

JV

*\*Gomphrena*

MK

*\*Alternanthera*

MK



*Hermbstaedtia* MK



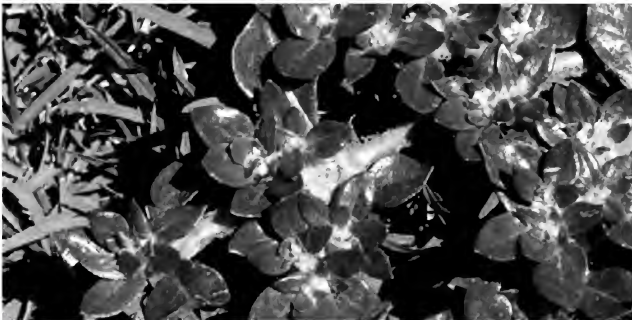
*Amaranthus* MK



*Hermbstaedtia* SPB



*Aerva* MK



*\*Guilleminea* MK



*Cyathula* GN



*Aerva* MK



*Pupalia* MK



# ANACARDIACEAE

## Wild currant family

A family of mainly trees and shrubs, rarely herbaceous climbers or lianas, all species with resin channels and clear resinous sap that becomes dark on drying.

### General information

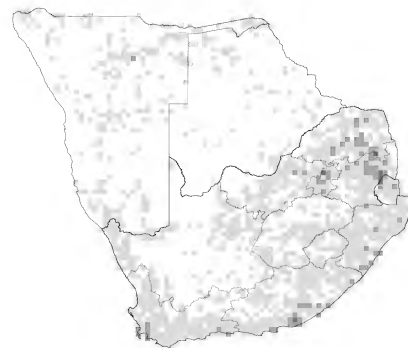
**Number of genera/species in the world:** ca. 60/ca. 600.

**Number of genera/species in FSA:** 14/133.

**Well-known FSA genera:** *Harpephyllum*, *Heeria*, *Lannea*, *Laurophyllus*, *Loxostylis*, *Ozoroa*, *Sclerocarya*, *Searsia*.

**Growth forms:** Mainly trees and shrubs, sometimes also climbers.

**Habitats:** Dry habitats and desert conditions to coastal scrub, grassland, woodland and forest.



### Distribution

This is a family mainly of tropical and subtropical areas. It has diversified in Central America, Central Africa, Madagascar, Indochina and Malaysia. Species are also found in the Mediterranean, East Asia and America. In southern Africa the highest diversity is along the Eastern Cape and KwaZulu-Natal coasts and in the eastern parts of the northern provinces.

### Flagship species

*Sclerocarya birrea* (marula; maroela [A]; morula [NS]) is a tree with pleasant, edible fruit. Parts of the plant are used as medicine for the treatment of diarrhoea, dysentery, gonorrhoea, rheumatism and as a prophylactic against malaria. Household utensils are made from the wood and the trunks are carved into boats. The fibrous layers of bark are used as string and ropes. Trees are planted near orchards to attract pollinators. Fruit are used for jams and jellies, and the seeds are dried and eaten.



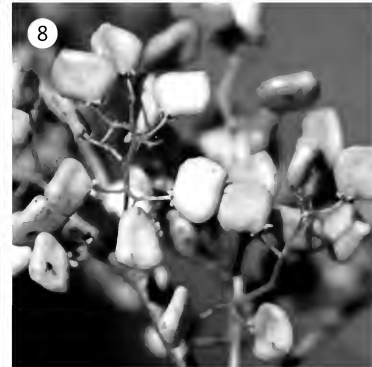
### Significance

Members of this family are used in the leather industry for their tannins. Important fruit include the mango and Jamaica plum, and nuts (e.g. cashew, pistachio). Fruit of the Brazilian pepper tree (*Schinus terebinthifolius*) is used in cooking and the pepper tree (*S. molle*) is widely cultivated as a garden ornamental for shade. Some trees are important in the timber industry (e.g. *Astronium*, *Myracrodruon* and *Schinopsis* species). Exudates from some species may cause violent allergic reactions.



## HOW TO IDENTIFY

Woody plants with resin channels especially in the bark and fruit. Leaves alternate; simple <sup>1</sup>, pinnately compound <sup>2</sup> or 3-foliolate <sup>3</sup>; without bracts. Flowers small <sup>4</sup>, green or yellow to white, usually with disc <sup>5</sup>; unisexual but with sterile parts of other sex. Corolla 5, free <sup>6</sup>. Anthers 5 or 10, free. Ovary superior, 1-locular with 1 seed. Styles 1–3, usually spaced widely apart <sup>7</sup> (here visible on fruit). Fruit often a sideways flattened drupe <sup>8</sup>. (Photos <sup>1</sup>: JF; <sup>2</sup> & <sup>5</sup>: GN).

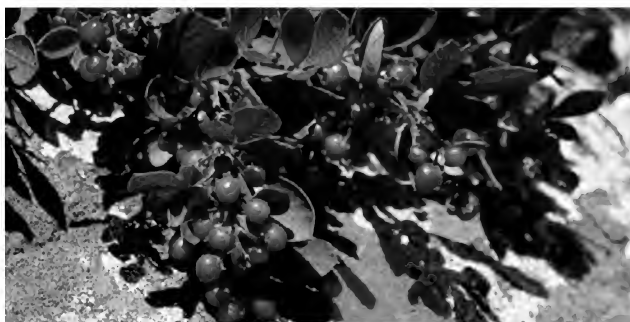


**DID YOU KNOW:** Marulas are used as flavourant in Amarula liqueur, and the fruits are rich in vitamin C.





*Harpephyllum* GN



*Searsia*

MK



*Searsia*

GN



*Smodingium*

GN



*Ozoroa*

MK



*Searsia*

SPB



*Protorhus*

NC



*Ozoroa*

MK



*Lannea*

GN



*Sclerocarya*

GN



*Searsia*

SPB



*Ozoroa*

SPB



*Loxostylis*

GN



*Searsia*

GN



# APIACEAE

(Umbelliferae)  
Carrot family

A large, readily identifiable family with many well-known culinary and medicinal species. The alternative name, Umbelliferae, refers to the conspicuous umbellate compound inflorescence typical for the family.

## General information

**Number of genera/species in the world:** ca. 453/ca. 3 750.

**Number of genera/species in FSA:** 48/240.

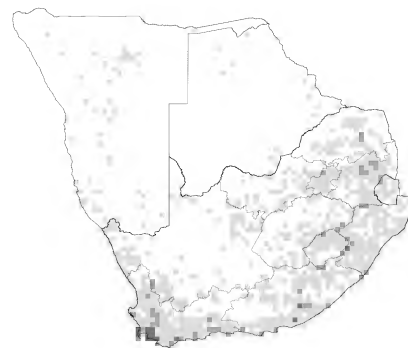
**Well-known FSA genera:** *Afrosciadium*, *Alepidea*, *Annesorhiza*, *Apium*, *Centella*, *Conium*, *Heteromorpha*, *Polemannia*.

**Growth forms:** Mostly herbaceous annuals, also biennials or perennial herbs and trees. Many species have basal rosettes but others may be stoloniferous or even cushion plants.

**Habitats:** Found in grassland, fynbos, open scrub, forest and moist places next to streams and rivers; some real aquatics, but also in dry environments.

## Flagship species

*Heteromorpha arborescens* (parsley tree; wilde-pietersieliebos [A]; umbangandlala [X, Z]) is a shrub or small tree with glossy leaves. Dried, hollowed stems of this plant are used by the Xhosa as musical instruments. In folklore it is planted at the gathering places and kraals of chiefs to ensure loyalty towards the leader. It is medicinally used to treat abdominal pains. An infusion of leaves is used to deworm children and infusions of roots are used for coughs and dysentery. The smoking of dried plants is said to relieve headaches. (Photo: NC).



## Distribution

This is a cosmopolitan family with increased diversity in temperate regions, particularly in the northern hemisphere. Within southern Africa, the Western Cape and the eastern escarpment show the highest diversity in species.

## Significance

This family is an important food source as the leaves, stems and roots are utilised, e.g. carrots (*\*Daucus carota*). Many are used as culinary herbs, e.g. parsley (*\*Petroselinum crispum*) or as spices, e.g. coriander (*\*Coriandrum sativum*). Many species have herbal and medicinal properties and the essential oils of some are used in the perfume industry. Some genera (*\*Eryngium*, *\*Astrantia*, *Bupleurum* and *\*Ammi*) are cultivated for the flower industry and others as ornamentals for their architectural inflorescences.



## HOW TO IDENTIFY

Aromatic herbs or trees, the stems with distinct pith <sup>1</sup> (sometimes hollow stem or internodes). Leaves alternate <sup>2</sup>, much-divided <sup>3</sup> with a sheath at the base <sup>4</sup>. Stipules absent. Flowers in simple or compound umbels <sup>5</sup>, usually flat-topped. Calyx reduced. Petals 5 <sup>6</sup>, free. Stamens 5, free. Inferior ovary with 2 separate styles borne on a cushion-like structure <sup>7</sup>. Fruit dry, separating into 2 mericarps, each with 5 lengthwise ridges <sup>8</sup> or wings. (Photos <sup>4</sup>: NC; <sup>8</sup>: JK).



**DID YOU KNOW:** Hemlock (\**Conium maculatum*) was used in ancient Greece to execute condemned prisoners (e.g. Socrates).



*Conium*

MK

*Alepidea*

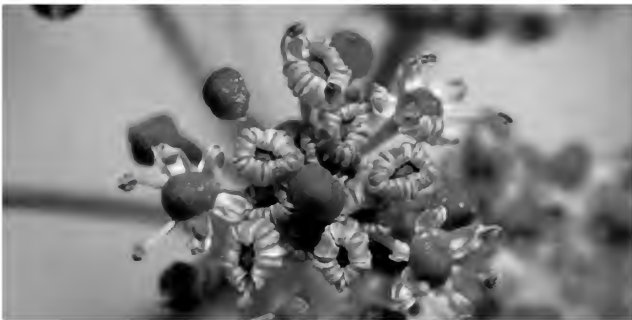
SPB

*Pimpinella*

MK

*Heteromorpha*

JB

*Deverra*

SPB

*Lichtensteinia*

SPB

*Notobubon*

SPB





*Hermas*

SPB



*Afrosiadium*

JK



*Alepidea*

JK



*Alepidea*

JK



*Berula*

SPB



*Arctopus*

SPB



*Steganotaenia*

GN



*Dasispermum*

SPB



# BRASSICACEAE

(Cruciferae)

## Mustard family

A cosmopolitan, mainly herbaceous family, recognised by cruciform flowers and the mustard taste of the leaves. Renowned for the numerous vegetables that belong to this family.

### General information

**Number of genera/species in the world:** ca. 340/ca. 3 350.

**Number of genera/species in FSA:** 29/174.

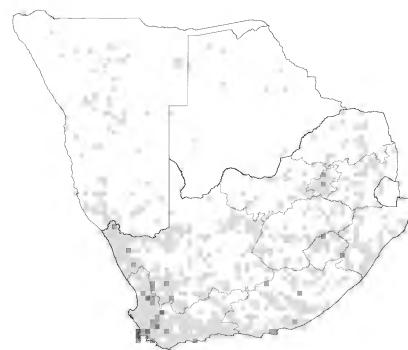
**Well-known FSA genera:** *Heliophila*, *Lepidium*, \**Raphanus*.

**Growth forms:** Annual or perennial herbs, shrublets or seldom small trees or climbers.

**Habitats:** Found in almost every kind of habitat from alpine areas to desert, forest and aquatic areas.

### Flagship species

*Heliophila juncea* (= *Brachycarpaea juncea*; wild stock; kraaibos [A]) is a willowy shrublet of up to 1 m high and is covered in white, mauve or purple flowers during spring and summer. Flowering is best after fire. The fruits are disc-shaped and woody when dry. This species is usually found in fynbos vegetation from the mountainous areas around Springbok in the north to the Eastern Cape.



### Distribution

Occurring worldwide, mostly in the northern hemisphere in countries surrounding the Mediterranean and in southwestern Asia, rarely found in the tropics. In southern Africa there is a concentration of species in the winter-rainfall area of the Western Cape.

### Significance

This family contains numerous and diverse crop plants, including food plants such as broccoli, cabbage and turnip; condiments and garnishes like mustard, cress and horseradish. Vegetables collected from the veld include *Lepidium* species and *Sisymbrium capense*. Certain *Lepidium* species are known to be used medicinally. Both edible and industrial oils are extracted from the seeds of some members of the family (\**Brassica*, \**Raphanus*, \**Sinapsis*). Some species are cultivated as garden ornamentals (\**Alyssum*, *Heliophila*, \**Nasturtium*).



## HOW TO IDENTIFY

Leaves alternate <sup>1</sup>, often in basal rosettes, without stipules and often with a mustard taste. Inflorescence usually a slender raceme <sup>2</sup> without bracts or bracteoles. Flowers regular with 4 sepals and 4 free petals, arranged in the form of a cross (cruciform) <sup>3</sup>. Stamens 6 <sup>4</sup>, usually 4 long and 2 short. Ovary superior <sup>5</sup>. Fruit a dry, 2-chambered capsule (silique or silicula), usually opening by two valves from below <sup>6</sup>.



DID YOU KNOW: Canola oil is produced in the Overberg region in the Western Cape.  
The oil is pressed from the tiny seeds of the canola plant (\**Brassica napus*).



*Lepidium*

MK

*Heliophila*

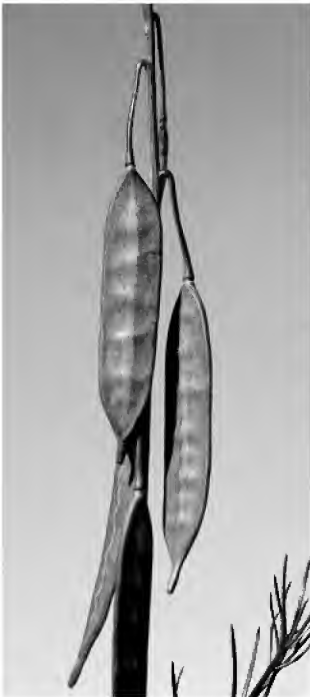
SPB

*Heliophila*

SPB

*Heliophila*

MK

*Heliophila*

SPB

*Sisymbrium*

MK

*Heliophila*

SPB

*Heliophila*

MK



*Heliophila*

SPB



*Heliophila*

MK



*Heliophila*

SPB



*Heliophila*

MK



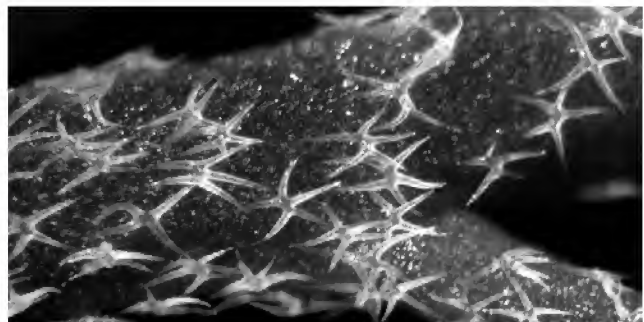
*Heliophila*

SPB



*Heliophila*

MK



*\*Capsella*

SPB



# BRUNIACEAE

## Brunia family

The family Bruniaceae is a very distinctive constituent of fynbos, exhibiting the typical characteristic features of fynbos plants. Despite its restricted distribution, it is popular outside the area as cut flowers and cultivated plants.

### General information

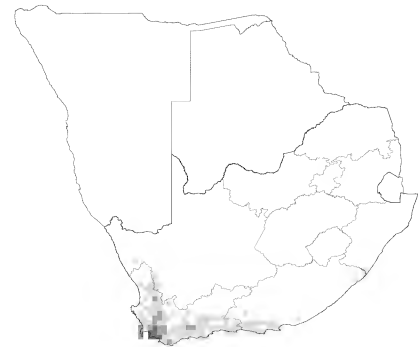
**Number of genera/species in the world:** 12/75.

**Number of genera/species in FSA:** 12/75.

**Well-known FSA genera:** *Berzelia*, *Brunia*, *Raspalia*, *Staavia*.

**Growth forms:** Subshrubs or shrubs, rarely small trees up to 4 m tall.

**Habitats:** In fynbos vegetation on Table Mountain Sandstone formations, often on mountain slopes and along water courses.



### Distribution

South African endemic. Mainly found in the Western and Eastern Cape, with one species in southern KwaZulu-Natal. Most species are endemic to the winter-rainfall area.

### Flagship species

*Brunia stokoei* (rooistompie [A]) is by far the most attractive species in this family. This tall-growing plant with distinctive red flowers grows in the Hottentots Holland Mountains and is quite common in the Betty's Bay and Kleinmond areas. The flowers produce copious nectar, which is sought after by sugar- and sunbirds.



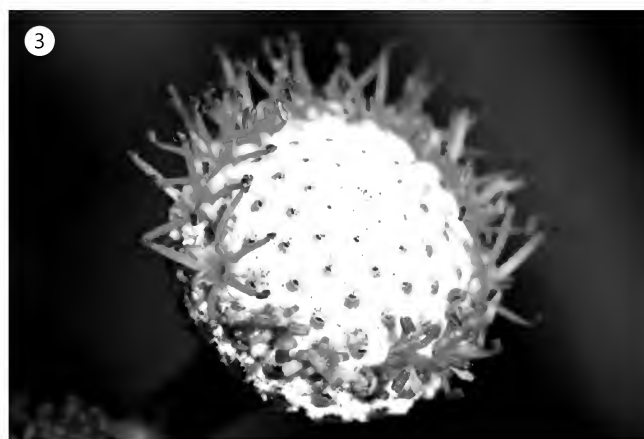
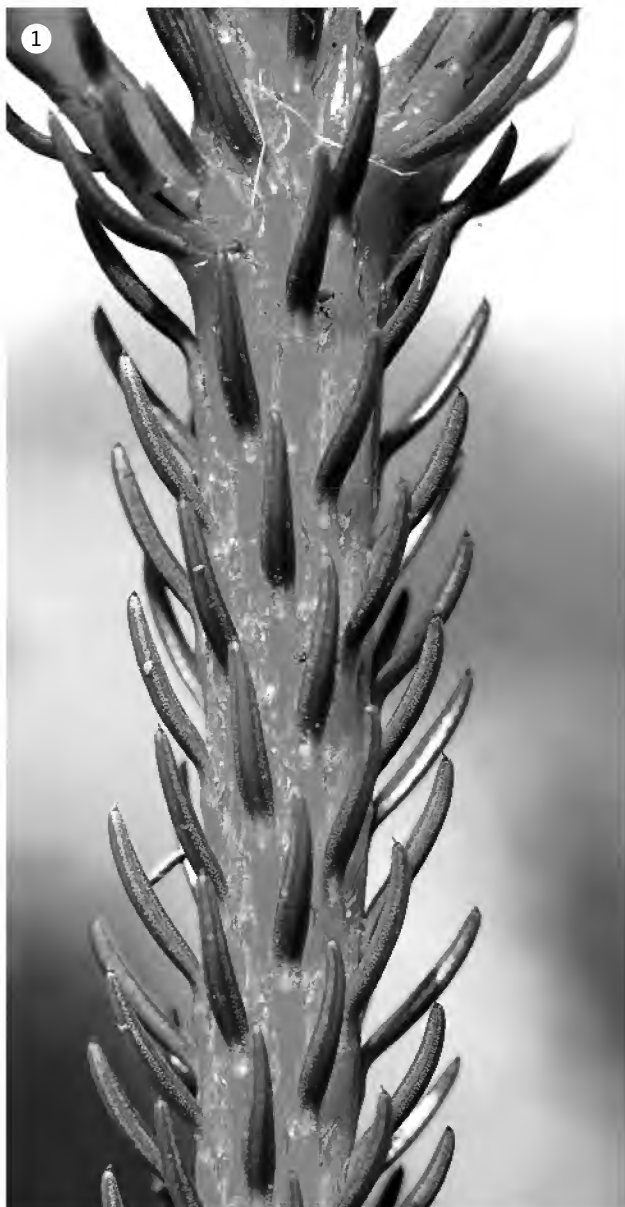
### Significance

A number of species are used in the dried and cut flower industry and are often dyed. The material is generally harvested from the wild. A few species are suitable for cultivation in gardens.



## HOW TO IDENTIFY

Heath-like shrubs (with leaves ericoid to scale-like, hard-textured, imbricate) <sup>1</sup>. Leaves alternate, with minute black tips (at least when young) <sup>2</sup>. Inflorescence a terminal dense spike or spherical capitulum with up to 400 flowers <sup>3</sup>. Flowers tubular and bisexual; sepals 5 <sup>4</sup>, free or connate; ovary inferior. Fruit indehiscent with 2–4 valves; seeds fleshy.



**DID YOU KNOW:** The family Bruniaceae is one of three families that are near-endemic to the Cape Floristic Region. There are only four families truly endemic to this region.



*Brunia*

MK

*Berzelia*

MK

*Staavia*

MK

*Brunia*

MK

*Brunia*

MK



*Brunia*

MK



*Brunia*

MK



*Staavia*

SPB



*Brunia*

MK



*Berzelia*

GN



*Brunia*

JF



*Berzelia*

GN



# CARYOPHYLLACEAE

(including Illecebraceae)

## Carnation family

A large family famed for carnations, pinks and baby's breath. Despite its size, plants are relatively uniform and easy to recognise.

### General information

**Number of genera/species in the world:** ca. 80/ca. 2 200.

**Number of genera/species in FSA:** 22/87.

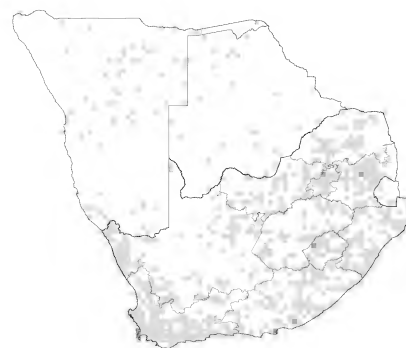
**Well-known FSA genera:** *Dianthus*, *Silene*.

**Growth forms:** Mostly perennial herbs or shrublets, rarely shrubs.

**Habitats:** Found in high altitude tropical mountains (absent from tropical lowland rain forest) to arid areas. Most species prefer dry, open habitats.

### Flagship species

*Silene burchellii* (gunpowder plant; kruitbossie [A]; kopane [SS]; injuju [Z]) commemorates the English botanist, William Burchell [1781–1863]. It is a widespread herb with white to pink flowers that open in the late afternoon and are presumably pollinated by moths. Plants flower throughout the year, but especially during spring. It is used medicinally as a tonic, to combat drowsiness, to treat scrofula or as a love charm.



### Distribution

Found worldwide, with highest diversity in temperate regions around the Mediterranean and adjacent parts of Europe and Asia. In southern Africa it is widespread, except in the more arid areas of the interior.

### Significance

Numerous cultivars of carnation (*\*Dianthus caryophyllus*) are grown worldwide, especially for the cut flower market. Other cultivated members of the family include species of *Silene*, *\*Gypsophila* and *\*Saponaria*. Some species (e.g. *\*Stellaria media*) are annual weeds of disturbed places. Certain species are used in traditional medicine to treat chest ailments, rheumatism and fever, or as good luck charms. The sweet fruit of waxberry (*Pollichia campestris*) are eaten by people and birds; this species is also browsed by game and stock. (Photo: HV).



## HOW TO IDENTIFY

Leaves opposite and decussate, very rarely alternate, the bases joined at the swollen nodes <sup>1</sup>, usually without stipules. Flowers regular with 4 or 5 free petals, with tips notched <sup>2</sup> or fringed <sup>3</sup>. Styles (2–5) are separate and slender <sup>4</sup>. Ovary superior <sup>5</sup>. Fruit usually a capsule that opens by means of teeth at the apex <sup>6</sup>.



DID YOU KNOW: The cushion-forming Antarctic pearlwort (*Colobanthus quitensis*) is one of only two flowering plants found in Antarctica.



*Cerastium*

MK

*Dianthus*

MK

*Dianthus*

SPB

*Dianthus*

JK

*Dianthus*

JV

*Dianthus*

MK

*Pollichia*

MK



*Spergularia*

JK



*Dianthus*

MK



*Dianthus*

MK



*Silene*

SPB



*Dianthus*

MK



*Dianthus*

MK



*Silene*

MK



# CELASTRACEAE

## Spike-thorn family

A family of trees or shrubs, rarely climbers, unarmed or with thorns (modified axillary shoots), some with latex in the leaves and bark, evident as elastic threads on breaking parts, and often with a yellow powdery pigment present on exposed bark. Flowers have pronounced floral discs, which develop into characteristic capsules or drupes, and in many species, seeds have fleshy arils.

### General information

**Number of genera/species in the world:** ca. 109/ca. 1 300.

**Number of genera/species in FSA:** 24/92.

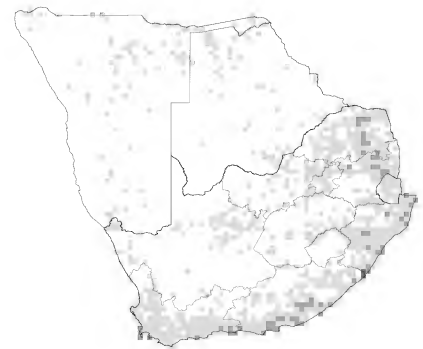
**Well-known FSA genera:** *Cassine*, *Catha*, *Elaeodendron*, *Gymnosporia*, *Hippocratea*, *Maytenus*, *Mystroxylon*, *Pterocelastrus*, *Putterlickia*, *Salacia*.

**Growth forms:** Trees, woody shrubs, climbers and rarely suffrutices (dwarf shrubs).

**Habitats:** Very variable in habitat choice including savanna, thicket, forest, grassland, coastal scrub areas and even desert.

### Flagship species

*Gymnosporia buxifolia* (common spike thorn; gewone pendoring [A]; uBangalala [Z]) is a thorny and very variable shrub or small tree that is widely distributed in southern Africa. It is distinguished by its small, round and rough fruit. In botanical literature it is frequently and wrongly referred to as *Maytenus heterophylla*. This plant produces very hard and strong wood that may be used for the making of tool handles, and for engraving and turnery. (Photo: GN).



### Distribution

Found in tropical and subtropical regions and extending into warmer temperate regions. In southern Africa higher levels of diversity are found in the eastern half of the region.

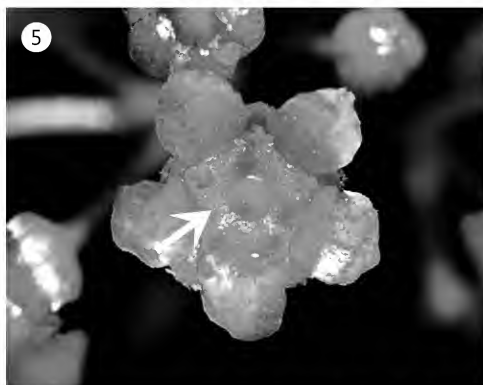
### Significance

The family has a wide range of medicinal applications. Extracts from some species are used as insecticides. Many species have edible fruit and seeds. Oil is derived from seeds of some species. The wood is used for timber; stems for basket weaving and bark for arrow poison. *Catha edulis* is used as a stimulant and chewed or drunk as a tea. \**Celastrus* and \**Euonymus* are popular ornamentals. The bark, young leaves and thorns of, e.g. *Gymnosporia* and *Cassine* species, are browsed by game and cattle. Birds relish the fruit of species with fleshy arils. (Photo: GN).



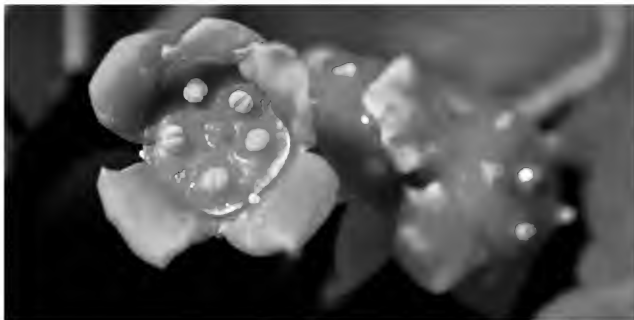
## HOW TO IDENTIFY

Woody plants; branches often angular <sup>1</sup>. Leaves alternate, clustered or opposite; stipules very small. Flowers small and regular <sup>2</sup>, white, pale yellow or green, sometimes red. Petals 5, free. Stamens 5, free <sup>3</sup>, arising from a disc. Ovary superior <sup>4</sup>, but partly sunk into flower disc <sup>5</sup> which is fleshy and nectar-secreting. Style short, 2- or 3-lobed. Fruit a capsule, flattened dehiscent mericarp or a drupe <sup>6</sup>. Seeds often winged or enclosed in coloured aril <sup>7</sup>, or without an aril. (Photo <sup>6</sup>: GN).



DID YOU KNOW: *\*Salacia oblonga* and *\*S. reticulata* from India and Sri Lanka are used in the prevention and treatment of type two diabetes and obesity.



*Pseudosalacia*

SPB

*Gymnosporia*

SPB

*Gymnosporia*

GN

*Putterlickia*

GN

*Cassine*

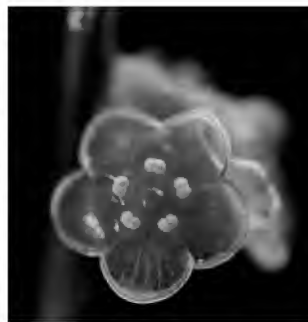
GN

*Putterlickia*

GN

*Maytenus*

GN

*Maytenus*

SPB



*Maytenus* GN



*Putterlickia* SPB



*Hippocratea* SPB



*Salacia* GN



*Pterocelastrus* JF



*Elaeodendron* GN



*Putterlickia* GN



*Gymnosporia* GN



# CHENOPODIACEAE

## Salt bush family

A large family with insignificant flowers, including important crops. Most members are adapted to grow in soils containing high concentrations of inorganic salts and are therefore dominant in salt marshes. Sometimes included in the Amaranthaceae but differs in having a membranous or succulent perianth versus a scarious one, and in having distinct filaments often united at the base into a hypogynous disc versus filaments united into a tube.

### General information

**Number of genera/species in the world:** ca. 102/ca. 1 500.

**Number of genera/species in FSA:** 14/173.

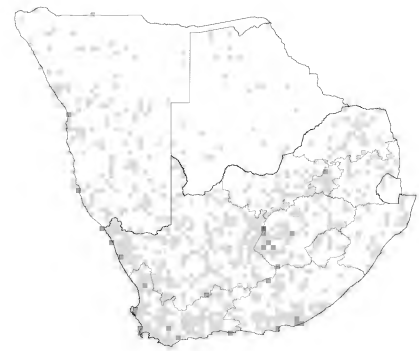
**Well-known FSA genera:** *Atriplex*, *Manochlamys*, *Salsola*.

**Growth forms:** Mostly annual or perennial herbs or shrubs and rarely small trees.

**Habitats:** Many members of the family thrive on saline or alkaline soils in arid areas.

### Flagship species

*Manochlamys albicans* (spanspekbos [A]) is a shrub with diamond-shaped leaves, widespread in the arid western parts of southern Africa. The minute, yellow flowers are clustered at the end of branches and appear during spring and summer. The succulent bracts that enfold the fruits were traditionally used as a soap substitute. It is a highly palatable plant and is an indicator of well-managed veld. (Photo: RDV).



### Distribution

Found worldwide in temperate and subtropical regions, particularly in saline habitats. In southern Africa the highest concentration is found in the drier, western parts of the region.

### Significance

This family contains food plants like spinach (*\*Spinacia oleracea*), chard and beetroot (*\*Beta vulgaris*) and quinoa (*\*Chenopodium quinoa*), a substitute for wheat/gluten. Some *Chenopodium* species are used as wild spinach (marog). In arid regions, certain species are important as fodder plants (*Atriplex*). *Salsola* generally comprises excellent grazing plants, but some species are reported to be poisonous to sheep. Others have traditionally been used in the soap-making process. Some members of the family are used medicinally to treat coughs, stomach aches and eczema; others are used as an insecticide (*Chenopodium*).



## HOW TO IDENTIFY

Deeply penetrating roots are common. Leaves simple, mostly alternate <sup>1</sup>, without stipules, often fleshy and covered with a 'powdery' indumentum <sup>2</sup>. Flowers regular, minute <sup>3</sup>, greenish and borne in spike-like or cymose inflorescences. Perianth of 2–5 tepals <sup>4</sup>. Ovary superior with 1 locule. Fruit a small nut or usually an achene <sup>5</sup> enclosed in bracteoles or the perianth <sup>6</sup> that become hard, fleshy, thorny or hooked.



**DID YOU KNOW:** The tuber of beetroot (*Beta vulgaris*) is an important source of sucrose and accounts for almost 30% of the world's sugar production.



*Atriplex*

MK

*Salsola*

MK

*Chenopodium*

MK

*Salsola*

MK

*Atriplex*

MK



*Sarcocornia*

ALR



*Salsola*

MK



*Salsola*

JK



*Manochlamys*

SPB



*Atriplex*

HV



*Atriplex*

MK



# EUPHORBIACEAE

## Euphorbia family

A very large and diverse family that has recently been divided into a number of different families. In this contribution it is treated in a very broad and liberal sense to include the Phyllanthaceae, Picrodendraceae and Putranjivaceae.

### General information

**Number of genera/species in the world:** ca. 250–300/ca. 5 000–6 300.

**Number of genera/species in FSA:** 54/537.

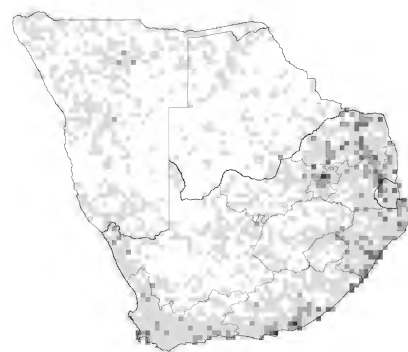
**Well-known FSA genera:** *Acalypha*, *Bridelia*, *Clutia*, *Croton*, *Dalechampia*, *Euphorbia*, *Jatropha*, *Monadenium*, *Phyllanthus*, *Sapium*, *Spirostachys*, *Tragia*.

**Growth forms:** Trees, shrubs, herbs, climbers or twiners and succulents. South African members mostly succulent.

**Habitats:** Found in a wide variety of habitats, e.g. scrub, woodland and forest, grassland, arid regions and desert.

### Flagship species

*Euphorbia ingens* (common tree euphorbia; gewone naboom [A]; mokgoto [NS]) grows into a tree of 15 m high and is characteristic of wooded areas in the northern regions of southern Africa. The soft wood is used for light wooden doors, planks and even canoes. The milky latex is toxic and caustic, but if applied correctly can be used medicinally as a purgative or for the treatment of ulcers. The seed is used as a fish poison. It is an excellent focus plant that attracts many insects and birds to the garden. (Photo: GN).



### Distribution

Cosmopolitan, mainly in tropics, but excluded from Antarctica. Southern Africa has higher levels of diversity along the south and east coast from Port Elizabeth to Durban and on the Mpumalanga escarpment to the Soutpansberg.

### Significance

Many species, especially the succulents, are cultivated as garden plants and ornamentals. Numerous species that originate from the temperate regions have become invasive. The tuberous roots of cassava (*\*Manihot esculenta*), is one of the major sources of food (starch) in tropical regions. *\*Hevea brasiliensis* is a source of rubber and is widely cultivated. Oil is extracted from the seeds of many species in this family, e.g. castor oil (*\*Ricinus communis*).



## HOW TO IDENTIFY

Herbaceous, woody, occasionally succulents with fleshy stems <sup>1</sup>. Plants often with watery or milky sap <sup>2</sup>. Leaves alternate with bracts <sup>3</sup>. Flowers unisexual, regular <sup>4</sup>; inflorescence sometimes a cyathium <sup>5</sup>. Calyx 5; corolla mostly or sometimes absent. Ovary superior, mostly 3-locular with 3-lobed style <sup>6</sup>. Fruit mostly a dry capsule <sup>7</sup>, seed sometimes with fleshy caruncle <sup>8</sup>. Many species with glands where the lamina and petiole meet (e.g. *Spirostachys*, *Croton*) <sup>9</sup>. (Photo 7: GN).



**DID YOU KNOW:** Cassava is a major staple food in the developing world providing a basic diet for about 500 million people.



*Euphorbia*

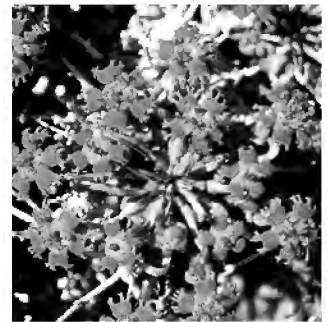
SPB

*Jatropha*

MK

*Acalypha*

SPB

*Euphorbia*

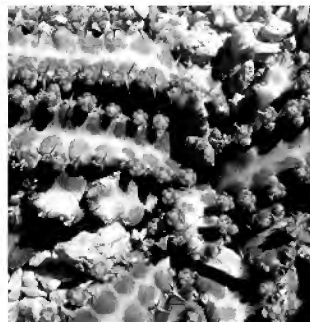
SPB

*Croton*

SPB

*Cavacoa*

GN

*Euphorbia*

JK

*Euphorbia*

MK



*Sapium*

GN



*Hyae nanche*

MK



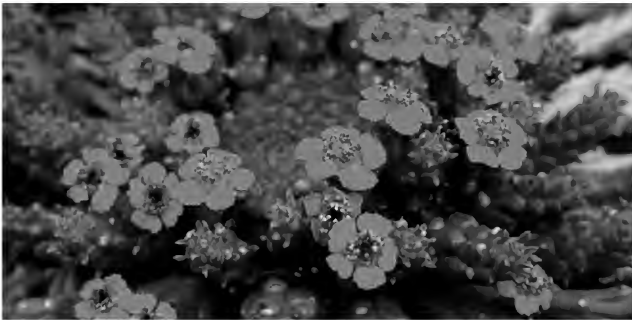
*Euphorbia*

JB



*Flueggea*

HV



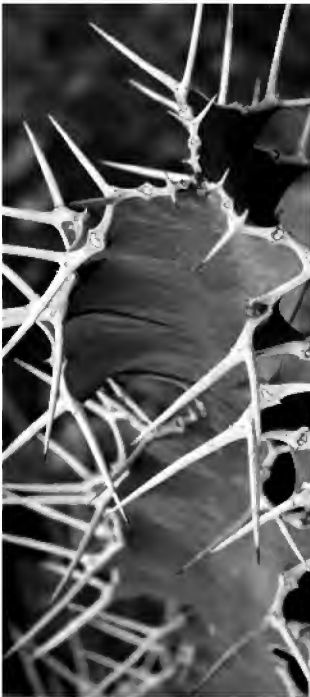
*Euphorbia*

GN



*Antidesma*

GN



*Euphorbia*

SPB



*Cleistanthus*

GN



*Tragia*

MK



*Euphorbia*

SPB



# FABACEAE

(Leguminosae)

Pea family

This economically important family is globally the third largest flowering plant family. The Poaceae (cereals) is possibly the only family more important when considering food production. Three subfamilies are distinguished.

## General information

**Number of genera/species in the world:** ca. 650/ca. 18 000.

**Number of genera/species in FSA:** 155/1 516.

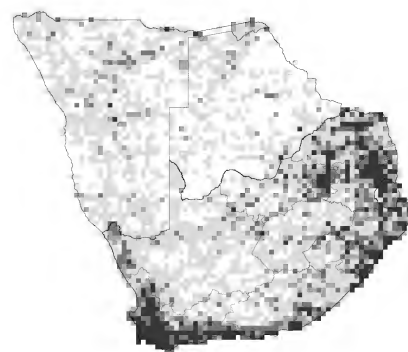
**Well-known FSA genera:** *Acacia*, *Aspalathus*, *Bauhinia*, *Caesalpinia*, *Crotalaria*, *Erythrina*, *Indigofera*, *Lotononis*, *Schotia*, *Senna*, *Sutherlandia*.

**Growth forms:** Mostly herbs, shrubs, trees, climbers and a few aquatic species; both woody and herbaceous.

**Habitats:** Found from coastal to open scrub, grassland to wet tropical habitats, arid vegetation and even desert.

## Flagship species

*Erythrina zeyheri* (ploegbreker [A]; motumo [SS]; umnsinsana [Z]) is a dwarf, deciduous shrublet that forms a huge underground tuberous rootstock. It grows in grassland in clay soils and usually moist areas. The Afrikaans common name was fittingly derived from the fact that numerous ploughs were broken by the underground tubers. It is reported that these tubers were smoked to alleviate asthma attacks.



## Distribution

This is a cosmopolitan family and only absent from Antarctica. In southern Africa there is especially high diversification in the winter-rainfall areas of the southern and southwestern Cape and in the northeastern provinces of South Africa.

## Significance

This family has a variety of economical uses. Plants are responsible for the fixing of nitrogen through symbioses with *Rhizobium* bacteria, thus making soils more fertile. Some farmers purposefully plant legumes to improve their soils. They are a main source of protein for people and animals and contain high amounts of minerals. The hardwood of many species is important in the timber industry. Wood is also widely used for fuel. Many species are used as medicines, spices, for their aromatic properties and also as ornamentals in gardens.



## HOW TO IDENTIFY

Leaves mostly compound, double-compound <sup>1</sup> or trifoliate <sup>2</sup>; leaf base sometimes swollen <sup>3</sup>. Ovary superior <sup>4</sup> and 1-locular. Fruit a pod <sup>5</sup>.



**DID YOU KNOW:** The cultivation of rooibos tea (*Aspalathus linearis*) is a threat to biodiversity in the Western Cape due to habitat destruction.



## Subfamily Papilionoideae

Leaves alternate; mostly compound with stipules or bracts. Flowers irregular. Corolla imbricate in bud, free or sometimes united; divided into a standard, 2 wings and 2 fused keel petals. Stamens usually 10, all free or sometimes 9 fused and 1 free. Seeds usually without an areole.

Well-known genera: *Aspalathus*, *Erythrina*, *Indigofera*, *Lotononis*, *Pterocarpus*, *Sutherlandia*.



*Argyrolobium*

MK



*Sophora*

GN



*Canavalia*

GN



*Otholobium*

GN



*Liparia*

SPB



*Eriosema*

SPB



*Tephrosia*

GN



*Mundulea*

SPB



*Sutherlandia*

MK



*Indigofera*

MK



*Crotalaria*

GN



*Baphia*

GN



*Podalyria*

SPB



*Pterocarpus*

SPB



*Lotononis*

SPB

*Psoralea*

GN

*Dalbergia*

SPB

*Lotononis*

SPB

*Pearsonia*

SPB

*Bolusanthus*

GN

*Wiborgia*

SPB

*Erythrina*

GN



*Lessertia*

HV



*Aspalathus*

SPB



*Zornia*

GN



*Sutherlandia*

HS



*Craibia*

GN



*Neorautanenia*

HV



*Sesbania*

SPB



## Subfamily Mimosoideae

Leaves alternate and mostly bipinnate; bracts present, often as spines. Flowers regular, mostly in dense inflorescences. Corolla 5, free or fused into a short tube. Sepals united basally; petals valvate in the bud and often united at the base. Stamens free, numerous, usually long, exserted and very obvious. Seeds usually have an areole on each side.

Well-known genera: *Acacia*, *Albizia*, *Dichrostachys*, *Elephantorrhiza*, *Mimosa*.

*Dichrostachys*

SPB

*Acacia*

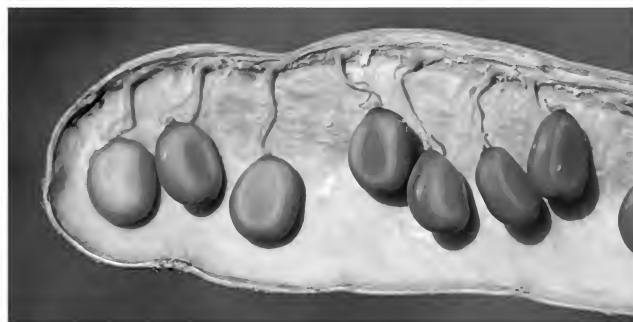
SPB

*Albizia*

GN

*Acacia*

GN

*Acacia*

SPB

*Elephantorrhiza*

SPB

*Calliandra*

HS



*Entada*

GN



*Elephantorrhiza*

SPB



*Acacia*

GN



*Entada*

GN



*Acacia*

SPB



*Adenopodia*

GN



*Acacia*

MK



*Albizia*

GN



*Dichrostachys*

GN



## Subfamily Caesalpinioideae

Leaves alternate, pinnately compound or deeply 2-lobed, with bracts. Flowers mostly irregular, usually large and showy. Corolla imbricate in bud, free or sometimes united; divided into a standard, 2 wings and 2 keel petals. Stamens mostly 10, free, usually in 2 whorls of 5 each.

Well-known genera: *Afzelia*, *Bauhinia*, *Burkea*, *Caesalpinia*, *Cassia*, *Colophospermum*, *Peltophorum*, *Schotia*, *Senna*.



*Caesalpinia*

HV



*Tylosema*

MK



*Dialium*

GN



*Peltophorum*

SPB



*Afzelia*

GN



*Umtiza*

GN



*Schotia*

GN



*Schotia*

GN



*Hoffmannseggia*

GN



*Dialium*

GN



*Afzelia*

GN



*Caesalpinia*

GN



*Senna*

SPB



*Colophospermum*

GN



*Bauhinia*

SPB



# GERANIACEAE

## Pelargonium family

The family Geraniaceae comprises annual or perennial herbs and dwarf shrubs. Many are cultivated as ornamentals and popular container plants. They produce striking displays and are easy to grow.

### General information

**Number of genera/species in the world:** ca. 11/ca. 800.

**Number of genera/species in FSA:** 5/339.

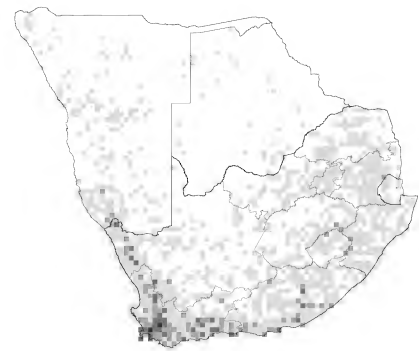
**Well-known FSA genera:** *Erodium*, *Geranium*, *Monsonia*, *Pelargonium*, *Sarcocaulon*.

**Growth forms:** Mostly perennial shrubs or dwarf shrubs, occasionally annual herbs, rarely scramblers, sometimes geophytes or succulents. Plants are characterised by pronounced taproots.

**Habitats:** Usually found in open scrub, grassland and regions with arid vegetation.

### Flagship species

*Pelargonium luridum* (waving pelargonium; wildemalva [A]; inyonkulu [Z]) is a very variable species, occurring from the Eastern Cape to southern Tanzania and westwards to Angola. It inhabits mainly grassland where this tall-flowered herb is distinct in the vegetation and easily recognised. *Pelargonium luridum* is medicinally widely used for ailments such as fever, vomiting, nausea and dysentery. It is also eaten raw as a vegetable. The species is easily grown from seed.



### Distribution

A cosmopolitan family, but mainly found in subtropical and temperate regions. In southern Africa the highest diversity is in Namaqualand, and the western and southern Cape.

### Significance

*Geranium* and *Pelargonium* have especially high commercial value as cultivated ornamentals for use as container, indoor and garden plants. *Sarcocaulon* species are threatened due to wild harvesting to provide for the horticulture industry. Members of this family are widely used for their medicinal properties, and leaf extracts of some *Pelargonium* species have antimicrobial effects. Essential oils derived from some species are used in the perfume, flavouring and pharmaceutical industries.



## HOW TO IDENTIFY

Herbs or shrublets, often aromatic. Leaves alternate <sup>1</sup> or in a basal rosette, simple, or pinnately or palmately divided <sup>2</sup>. Stipules present <sup>3</sup>. Flowers mostly irregular <sup>4</sup> with 4 free sepals and 5 petals. Stamens 10–15 <sup>5</sup>, free or fused at base. Ovary superior. Style 3–5-lobed <sup>6</sup>. Fruit a dry schizocarp, with mericarps 1-seeded, tapering from the apex to the base, ending as a spirally twisted awn when ripe <sup>7</sup>; awns usually with long hygroscopic hairs <sup>8</sup>. (Photos <sup>2</sup>: GN; <sup>5</sup>: LF).



**DID YOU KNOW:** The so-called geranium plants (*Pelargonium* species) have historically been one of South Africa's earliest exports to Europe where they were grown as container plants.



*Pelargonium**Pelargonium*

GN

*Sarcocaulon*

SPB

*Pelargonium*

GN

*Pelargonium*

GN

*Monsonia*

MK

*Sarcocaulon*

SPB

*Pelargonium*

HV

*Geranium*

SPB



*Sarcocaulon*

SPB



*Pelargonium*

SPB



*Erodium*

SPB



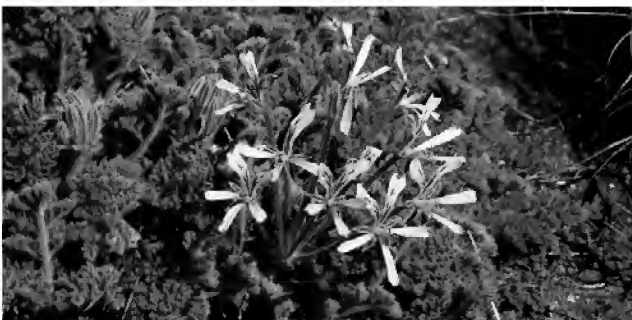
*Pelargonium*

SPB



*Monsonia*

MK



*Pelargonium*

MK



*Geranium*

MK



# MALVACEAE

(excluding Sterculiaceae, Tiliaceae and Bombacaceae)

## Hibiscus family

A family of mostly herbs or shrubs, covered with star-shaped hairs intermixed with simple hairs. The common name, malva, is widely used for members of the genus *Pelargonium* (Geraniaceae) which is not closely related to the family Malvaceae.

### General information

**Number of genera/species in the world:** ca. 90/ca. 2 000.

**Number of genera/species in FSA:** 21/165.

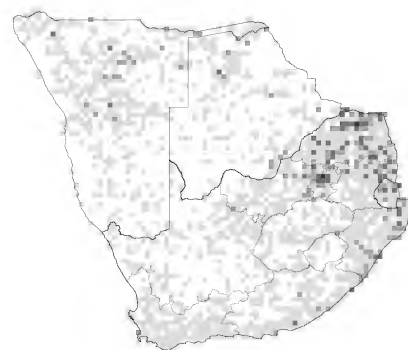
**Well-known FSA genera:** *Abutilon*, *Anisodonteia*, *Gossypium*, *Hibiscus*, *Malva*, *Pavonia*, *Radyera*, *Sida*.

**Growth forms:** Mostly herbs and shrubs, rarely small trees or climbers.

**Habitats:** Mainly in savanna, scrub and along forest edges.

### Flagship species

*Hibiscus praeteritus* (kleinrooihibiskus [A]) with its red to pink flowers is a colourful and floriferous species. It is a small shrub growing to  $\pm 1$  m tall and is an excellent choice for cultivation, especially if a number of plants are grouped together in a garden, because it needs so little water. Plants flower almost throughout the year depending on prevailing weather conditions. The species is widely distributed in the frost-free areas of southern Africa, Angola and Mozambique as far north as Malawi.



### Distribution

Occurring in tropical and subtropical areas and extending into temperate regions. It is widespread over the whole of southern Africa but the highest diversity is found in the northern provinces of South Africa.

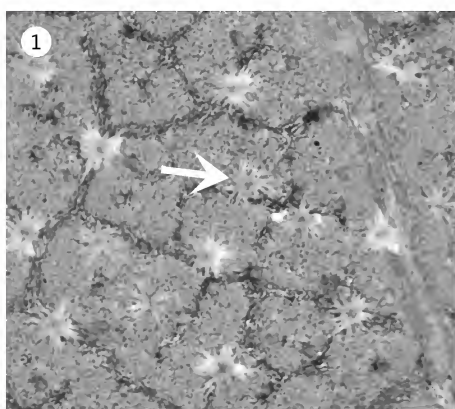
### Significance

Cotton from mainly two *Gossypium* species is the most important commodity produced from this family. Many other species are used as ornamentals and even pot plants (e.g. *Abutilon* and *Hibiscus* species). Many members of the genus *Hibiscus* are used for teas, making paper, and their flowers are important in the Hindu religion. Okra and roselle are cultivated for their fleshy calyces that have a high concentration of vitamin C. (Photo: RDV).



## HOW TO IDENTIFY

Herbs or shrubs often with star-shaped hairs <sup>1</sup>. Leaves alternate <sup>2</sup>, usually variously lobed, palmately veined <sup>3</sup> and with stipules. Flowers regular <sup>4</sup>. Calyx 5, usually free, epicalyx mostly present <sup>5</sup>. Corolla 5, free. Stamens numerous, fused with base of corolla, forming a staminal tube surrounding the style <sup>6</sup>. Anthers free. Ovary superior <sup>7</sup>, 5-locular. Style branched at apex <sup>8</sup>. Fruit dry, capsules dehiscent or splitting into mericarps <sup>9</sup>.



**DID YOU KNOW:** With the automated separation of seeds from fibres and the mechanisation of textile production during the Industrial Revolution, cotton became more popular than flax and wool textiles.



*Abutilon*

HV

*Anisodonteia*

GN

*Sida*

HV

*Gossypium*

MK

*Sida*

GN

*Hibiscus*

GN



*Hibiscus*

GN



*Pavonia*

GN



*Hibiscus*

GN



*Radyera*

SPB



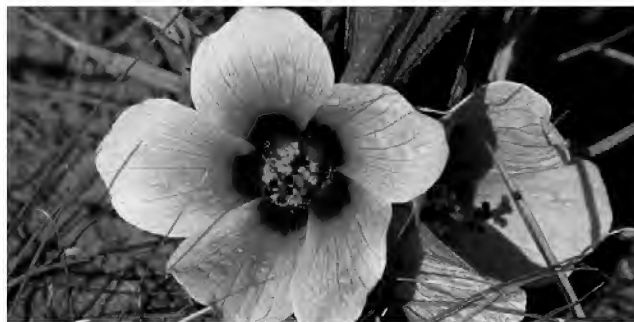
*Azanza*

SPB



*Thespesia*

GN



*Hibiscus*

LF



*Gossypium*

MK



# MESEMBRYANTHEMACEAE

## Vygie family

A large family of succulent plants with daisy-like flowers; able to survive long periods of drought. Sometimes included in the Aizoaceae but is distinguished from the latter by petals of staminodal origin, presence of needle-shaped crystals of calcium oxalate, the absence of styles and the hygrochastic fruit capsules. Two subfamilies are recognised on the basis of the placentation of the ovules (seeds).

### General information

**Number of genera/species in the world:** ca. 123/ca. 1 680.

**Number of genera/species in FSA:** 125/1 761.

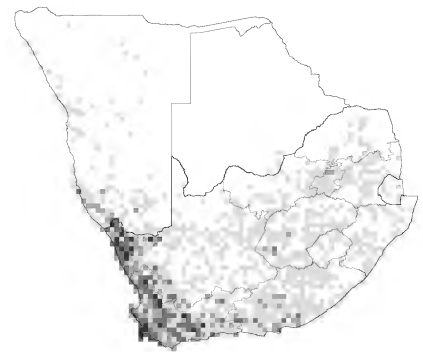
**Well-known FSA genera:** *Conophytum*, *Dorotheanthus*, *Mesembryanthemum*, *Lampranthus*, *Ruschia*.

**Growth forms:** Annual or perennial succulent herbs, shrublets or shrubs.

**Habitats:** Found in diverse habitats; from sand dunes to sub-alpine slopes, mostly found in winter-rainfall areas in well-drained sandy gravel, or in rock crevices.

### Flagship species

*Carpobrotus edulis* (sour fig; suurvy [A]) is a perennial succulent forming dense mats in sandy soil. The leaves are triangular in cross-section and often reddish green. The yellow flowers fade to pink and are mostly borne during spring and early summer. The fruits are eaten fresh or dried, or are prepared as a preserve; it is also an important ingredient of oriental cooking in the Cape. The leaf juice is used medicinally to treat infections, digestive trouble and tuberculosis and is applied externally to treat eczema, wounds and burns. (Photo: RDV).



### Distribution

Most members of this family are found in southern Africa, with a few species in Australasia, Mediterranean areas, Asia, South America and North Africa. In southern Africa the highest diversity is found in the Succulent Karoo Biome.

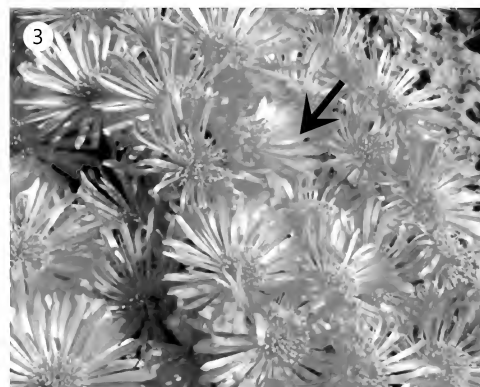
### Significance

Some members are cultivated as garden ornamentals (*Drosanthemum*, *Lampranthus*) or curiosity plants (*Conophytum*, *Lithops*), while others are planted to stabilise soil (*Carpobrotus*). Some species are used medicinally (*Carpobrotus*, *Sceletium*) to treat sore throat, fungal infections and even as stimulants. Species of *Psilocaulon* were traditionally used in the soap-making process and in the building of cooking shelters (kookskerms) around fires in the northwestern Cape.



## HOW TO IDENTIFY

Leaves mostly opposite, succulent <sup>1</sup>, without stipules. Sepals 4–6 more or less united below <sup>2</sup>. Flowers regular with numerous brightly coloured, free petaloid staminodes <sup>3</sup>. Stamens numerous <sup>4</sup>. Ovary inferior <sup>5</sup> or half-inferior, usually with 5 locules. Fruit a many-seeded, hygrochastic capsule <sup>6</sup> opening by means of valves <sup>7</sup>; rarely a berry or nut.



**DID YOU KNOW:** The capsules in this family open as a result of moisture that causes the valves to lift and the seeds are then expelled by falling raindrops.



## Subfamily Mesembryanthemoideae

Axile placentation (ovules/seeds attached to the central axis of the ovary/fruit) and expanding keels reach to the centre of the fruit. Species mostly weedy, with stems and leaves soft in texture and often with prominent water cells on the leaves.

Well-known FSA genera: *Mesembryanthemum*, *Phyllobolus*, *Sceletium*.



*Phyllobolus*

SPB



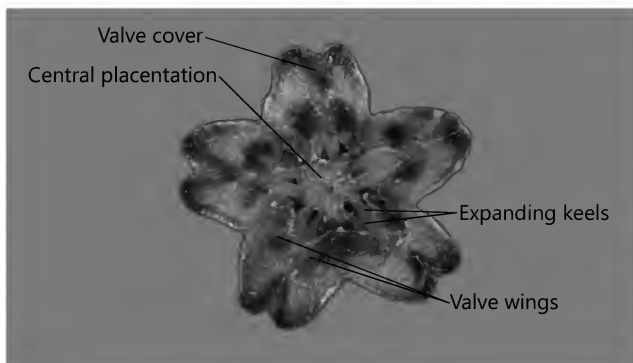
*Aptenia*

GN



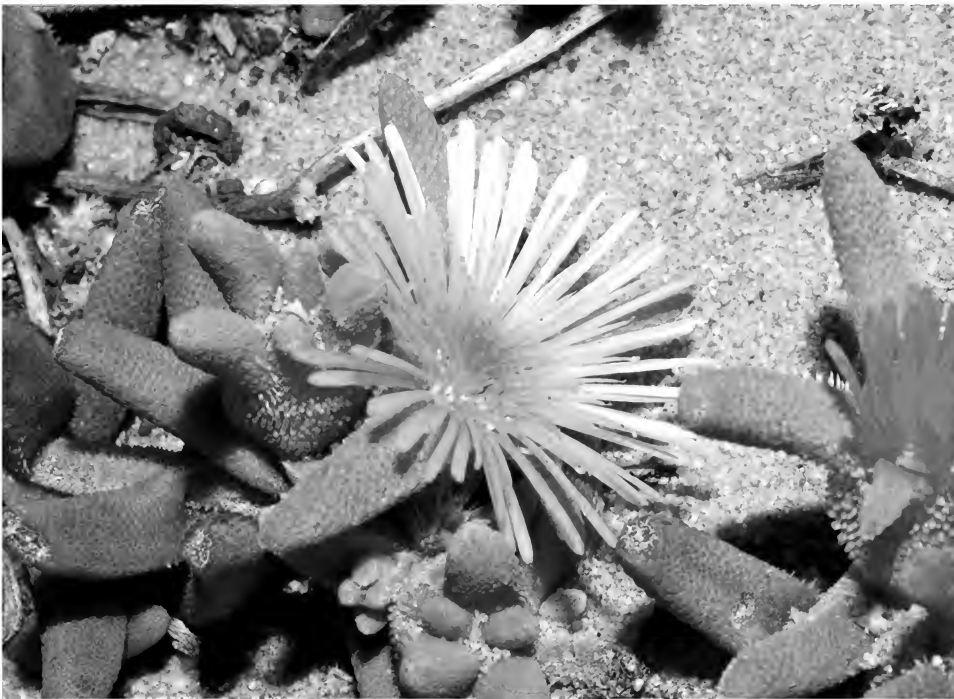
*Mesembryanthemum*

MK



*Mesembryanthemum*

MK



*Phyllobolus*

SPB



*Prenia*

SPB



*Sceletium*

MK



*Phyllobolus*

HS



*Phyllobolus*

SPB



## Subfamily Ruschioideae

Parietal or basal placentation (ovules/seeds are attached to the inside of the outer walls or the base of the ovary/fruit) and diverging expanding keels do not reach the centre of the fruit. Species are mostly dwarf shrubs with succulent leaves.

Well-known FSA genera: *Cleretum*, *Delosperma*, *Lampranthus*, *Ruschia*.



*Cleretum*

MK



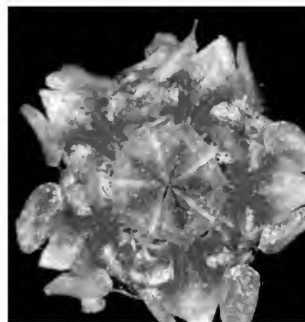
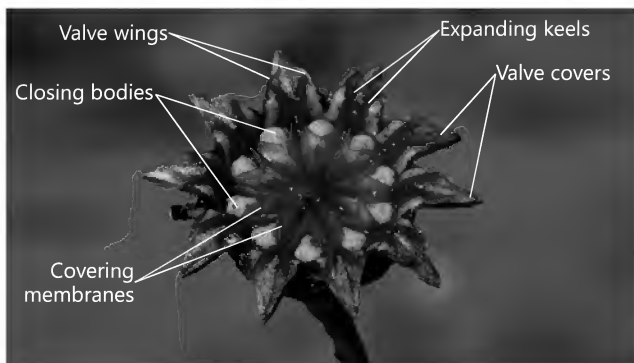
*Drosanthemum*

MK



*Frithia*

MK



*Lampranthus*

PMB



*Carpobrotus*

MK



*Jordaniella*

SPB



*Cheiridopsis*

MK



*Delosperma*

SPB



*Psammophora*

SPB



*Oscularia*

EE



*Tanquana*

PMB



*Cheiridopsis*

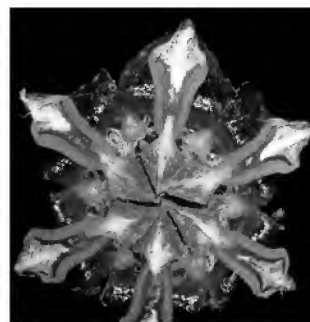
MK

*Dorotheanthus*

MK

*Oophytum*

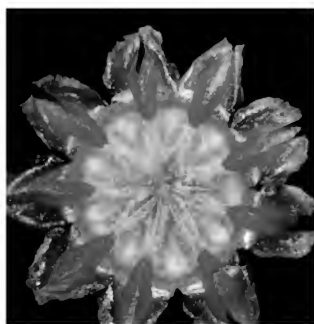
MK

*Astridia*

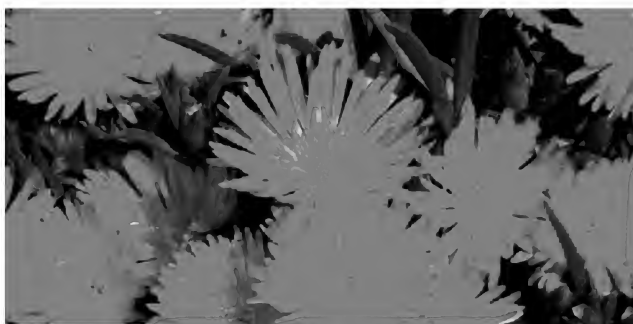
PMB

*Pleiospilos*

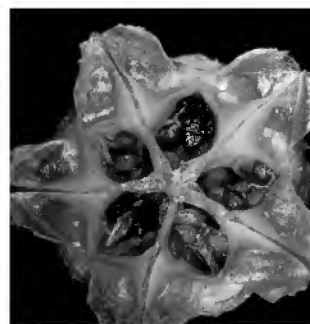
GN

*Malephora*

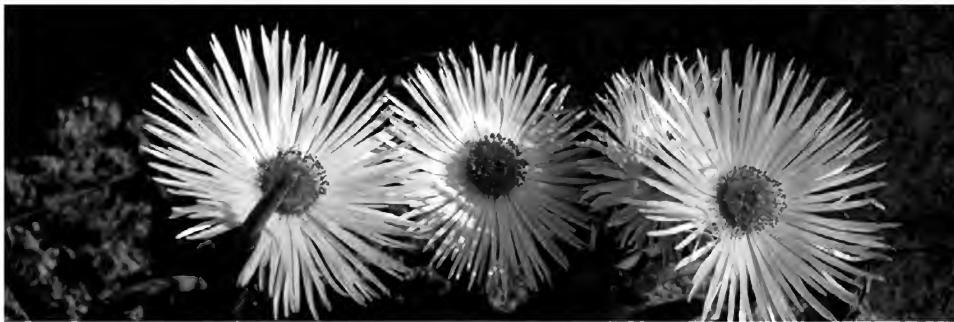
PMB

*Lampranthus*

MK

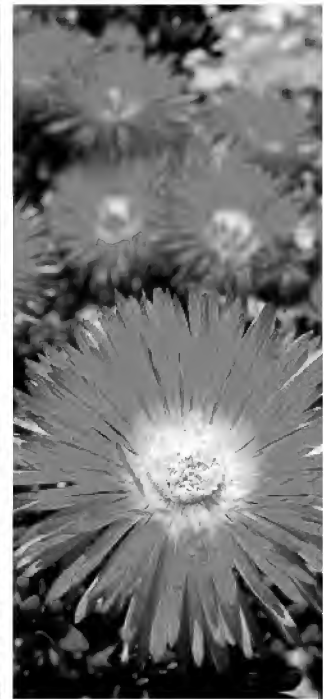
*Cleretum*

PMB



*Cephalophyllum*

SPB



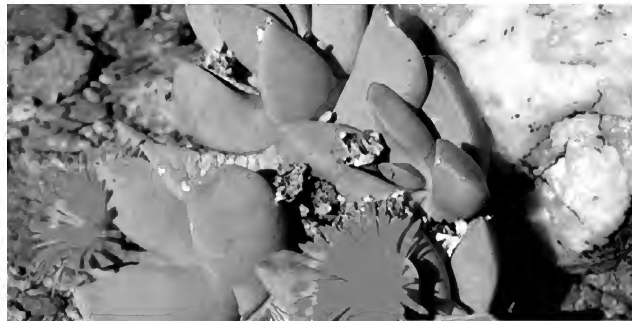
*Drosanthemum*

JK



*Trichodiadema*

GN



*Schwantesia*

HS



*Ruschia*

MK



*Conicosia*

HS



*Gibbaeum*

PMB



*Ruschia*

MK



# MOLLUGINACEAE

## Carpet weed family

The family Molluginaceae consists of herbs or dwarf shrubs with fleshy or succulent leaves. Species are widespread in southern Africa.

### General information

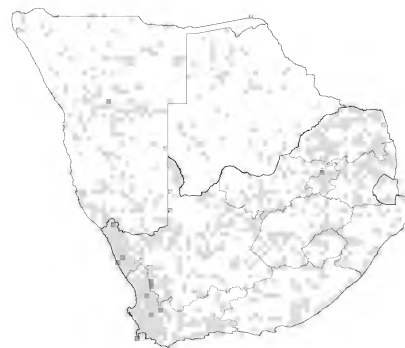
**Number of genera/species in the world:** ca. 16/ca. 120.

**Number of genera/species in FSA:** 10/107.

**Well-known FSA genera:** *Adenogramma*, *Hypertelis*, *Limeum*, *Mollugo*, *Pharnaceum*, *Psammotropha*.

**Growth forms:** Mostly herbs and dwarf shrubs.

**Habitats:** Mostly found in sandy places in arid areas.



### Distribution

Occurs mainly in the tropics and subtropics. Southern Africa is regarded the centre of diversity for this family with the highest diversity along the Namaqualand coast.

### Flagship species

*Hypertelis salsoloides* (haassuring [A]) is a frequently encountered species along the Namaqualand coast where it is specifically adapted to saline conditions. It is widespread over the Northern, Western and Eastern Cape provinces and Namibia where it is found in dry situations. It grows in sandy and brackish places and is abundant in disturbed areas. The blue-green succulent leaves and pink to white flowers make this an attractive little plant. The leaves have a sour taste and are eaten by domesticated animals but seldom by wild animals.



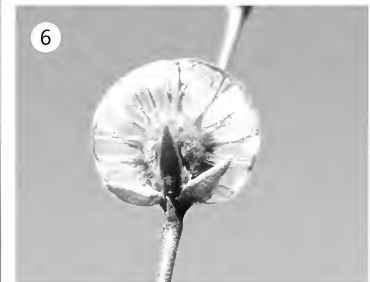
### Significance

This family is of little economic value. Many species have a 'weedy' nature and frequently invade disturbed places. Some species are important forage plants. The young leaves and stems of *Glinus lotoides* are used as a vegetable. *Glinus* and *Mollugo* are also used in traditional medicine. *Limeum africanum* is highly palatable and an indicator of well-managed veld. (Photo: HV).



## HOW TO IDENTIFY

Leaves opposite, whorled or alternate without stipules or with membranous stipules. Flowers mostly small <sup>1</sup>, regular <sup>2</sup> with (4)5, green-white, sometimes pink or red, but usually white petaloid sepals <sup>3</sup>. Stamens 5–10, free <sup>4</sup>. Ovary superior <sup>5</sup> with several locules; styles as many as locules. Fruit a capsule <sup>6</sup>. (Photo <sup>6</sup>: HV).



DID YOU KNOW: On the Galapagos Islands *Mollugo* is one of the first plants to establish on a bare lava field.



*Hypertelis*

MK

*Limeum*

HV

*Pharnaceum*

SPB

*Glinus*

WW

*Limeum*

MK

*Pharnaceum*

SPB

*Psammotropha*

SPB

*Corbichonia*

JK



*Hypertelis*

MK



*Psammotropha*

SPB



*Pharnaceum*

SPB



*Pharnaceum*

SPB



*Hypertelis*

MK



*Limeum*

SPB



# OXALIDACEAE

## Oxalis family

The genus *Oxalis* is the largest in this family (about 500 species) and particularly diverse in southern Africa and South America (Andes region). In southern Africa a single species of *Biophytum* occurs in the Caprivi Strip (Namibia).

### General information

**Number of genera/species in the world:** 5/ca. 880.

**Number of genera/species in FSA:** 2/250.

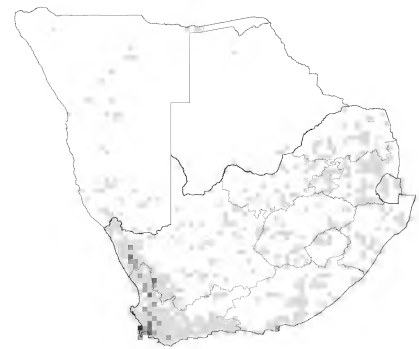
**Well-known FSA genera:** *Oxalis*, *Biophytum*.

**Growth forms:** Annual and perennial herbs; mostly geophytes producing rhizomes or bulbs; occasionally succulents.

**Habitats:** Found on a variety of soil types, most commonly on loam and sand, often in rock crevices or on open flats, in gardens, with a single aquatic species.

### Flagship species

*Oxalis pes-caprae* (Bermuda buttercup; klawersuring [A]) can justly be called 'a pretty harmless pest'. It produces bright yellow flowers, is invasive but does not cause much harm in southern Africa. It reproduces mainly by numerous underground bulbs that easily break from the stems if the plants are pulled out. It is therefore difficult to eradicate and is regarded as a highly invasive noxious weed in the United States, Europe, Israel and Australia. The sour leaves are traditionally used in stews to provide a unique flavour.



### Distribution

Tropical and temperate areas in the world. In southern Africa it has its highest concentrations in the Western and Northern Cape from the Cape Peninsula to Namaqualand.

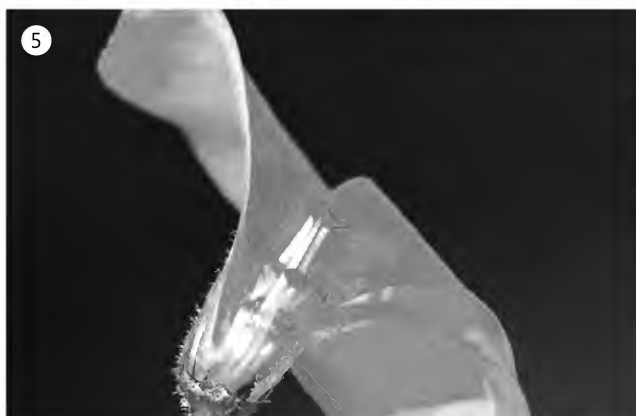
### Significance

Some species are widely naturalised weeds, e.g. yellow sorrel (*\*Oxalis corniculata*) and pink garden sorrel (*\*O. latifolia*), while a few others are popular garden plants (e.g. *O. flava*, *O. lanata* and *O. purpurea*). The plants contain oxalic acid and when consumed in very high quantities this may cause poisoning in stock and humans. \*Oca (*\*O. tuberosa*) originated in the Andes of South America and bears tubers similar to potatoes. It is cultivated in cool temperate regions of South America and New Zealand.



## HOW TO IDENTIFY

Rootstock a scaly bulb <sup>1</sup>. Leaves compound with 3 (rarely up to 10), leaflets <sup>2</sup>. Flowers regular <sup>3</sup>; petals twisted in bud <sup>4</sup>; stamens 10 in 2 dissimilar whorls <sup>5</sup>, basally fused; styles 5, free; ovary superior. Fruit a capsule <sup>6</sup>.



**DID YOU KNOW:** The southeast Asian star fruit (*Averrhoa carambola*), a popular colourful fruit eaten fresh or in salads, also belongs to this family.



*Oxalis*

MK

*Oxalis*

MK

*Oxalis*

MK

*Oxalis*

MK

*Oxalis*

MK

*Oxalis*

MK

*Oxalis*

SPB

*Oxalis*

MK



*Oxalis*

MK



*Biophytum*

MK



*Oxalis*

MK



*Oxalis*

MK



*Oxalis*

MK



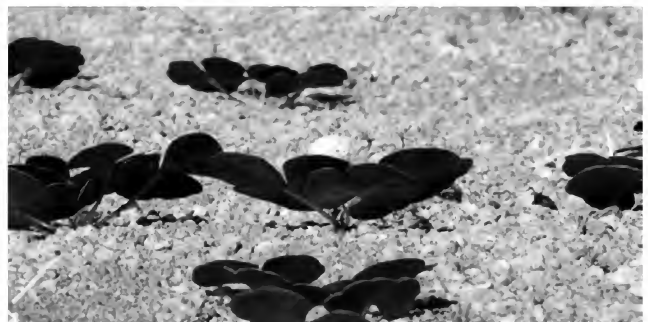
*\*Averrhoa*

MK



*Oxalis*

MK



*Oxalis*

MK



# POLYGALACEAE

## Polygala family

Polygalaceae flowers are superficially similar to those of the pea family (Fabaceae) but the lower keeled petal usually has a tufted appendage at the tip. The family is quite widespread but absent from the extreme northern and southern areas of the world.

### General information

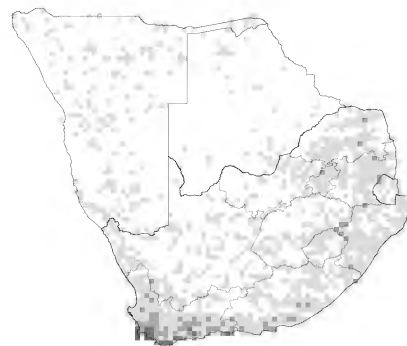
**Number of genera/species in the world:** 80/ca. 950.

**Number of genera/species in FSA:** 4/214.

**Well-known FSA genera:** *Muraltia*, *Polygala*, *Securidaca*.

**Growth forms:** Herbs and shrubs, or rarely trees.

**Habitats:** Fynbos, grassveld and bushveld in a variety of habitats.



### Distribution

The family is widespread in warm and temperate countries. In southern Africa the genus *Muraltia* is most common in the Western Cape, while *Polygala* is widespread but has higher numbers of species further north.

### Flagship species

*Polygala myrtifolia* (Septemberbush; Septemberbossie [A]) occurs naturally along the southern and eastern coastal regions of South Africa, but is widely planted elsewhere. It is evergreen and flowers profusely around September but often bears flowers throughout the year. The pink flowers are very attractive and a good source of nectar for carpenter bees. Plants can be planted on their own or as a hedge, which can be pruned more than once a year. Leaves are used medicinally to treat gout.

### Significance

A number of *Polygala* species are used medicinally (e.g. *P. fruticosa* and *P. virgata*) for various ailments. Medicinally it is used for respiratory problems, as an anti-inflammatory and a wide variety of other ailments. An overdose can be potentially fatal. A curious member of the family, *Securidaca longipedunculata* (violet tree; krinkhout [A]), grows into a handsome tree of up to 7 m tall. It has large pink flowers without the characteristic tufted keel and a single-seeded fruit with a single long wing. It makes an attractive garden subject.



## HOW TO IDENTIFY

Leaves alternate, simple, entire <sup>1</sup>. Flowers irregular, at tip of branches <sup>2</sup>; 5 sepals, inner 2 sepals wing-like <sup>3</sup>; 3–5 petals reduced with brush-like appendage on lowest petals <sup>4</sup>; 8 stamens united into a tube and fused to the petals <sup>5</sup>; anthers opening through apical pores; ovary superior and 2-chambered; seeds covered in short hairs.



DID YOU KNOW: More than half of the species in the family belong to one genus: *Polygala*.



*Polygala*

SPB

*Securidaca*

MK

*Nylandtia*

SPB

*Nylandtia*

MK

*Muraltia*

GN

*Polygala*

SPB

*Muraltia*

MK

*Polygala*

GN



*Polygala*

MK



*Polygala*

MK



*Muraltia*

MK



*Polygala*

MK



*Polygala*

SPB



*Muraltia*

MK



*Polygala*

GN



*Polygala*

MK



# RHAMNACEAE

## Buffalo-thorn family

A large, cosmopolitan family of mostly trees and shrubs with inconspicuous white or green flowers. Their stipules are often modified into tendrils or hooked spines.

### General information

**Number of genera/species in the world:** ca. 52/ca. 925.

**Number of genera/species in FSA:** 10/201.

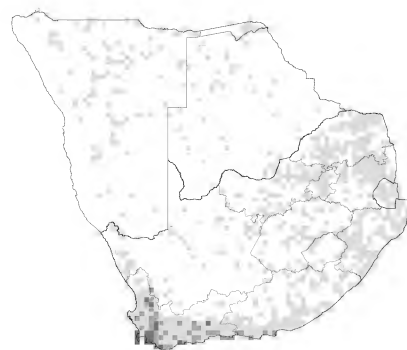
**Well-known FSA genera:** *Berchemia*, *Phyllica*, *Rhamnus*, *Ziziphus*.

**Growth forms:** Mostly trees and shrubs (erect or rarely climbing).

**Habitats:** Found in a wide range of habitats including tropical rain forest, savanna, fynbos and arid areas like karoo and desert.

### Flagship species

*Rhamnus prinoides* (dog wood; blinkblaar [A]; umnyenye [Z]) is a scrambling shrub or small tree found along forest margins and stream banks. The leaves are dark green and shiny with neatly serrated margins. The small, greenish flowers are borne from November to January and attract insects. The red, fleshy fruit are eaten by birds. The roots and leaves are used for medicinal and magical purposes and it is often planted as a decorative garden and hedge plant.



### Distribution

Widely distributed throughout the world; in southern Africa the highest number of species is found in the Western Cape.

### Significance

Some species are used as ornamental plants (\**Ceanothus*, *Helinus*, *Phyllica*, *Ziziphus*) or the source of dyes (*Rhamnus*). Also used for medicinal purposes, e.g. to treat wounds, chest problems, backache and cholera and as a laxative (*Helinus*, *Rhamnus*, *Ziziphus*). The roots contain saponin, which froths when mixed with water, and is used as a soap substitute. Fresh or candied dried fruit of jujube (\**Ziziphus jujuba*) are eaten as a snack, especially in the Middle and Far East. Introduced species of *Rhamnus* and *Ziziphus* may become invasive.



## HOW TO IDENTIFY

Leaves simple, usually alternate <sup>1</sup> or spirally arranged, sometimes opposite or subopposite <sup>2</sup> (*Berchemia*, *Lasiodiscus*, *Scutia*); some with 3–5 main veins from the base <sup>3</sup> (*Ziziphus*) and a glossy surface <sup>4</sup>. Stipules small or modified into tendrils or spines <sup>5</sup> (absent in *Phyllica*). Flowers small, regular and inconspicuous with 4 or 5 free, often reduced petals and 4 or 5 stamens <sup>6</sup>. Nectar-secreting disc usually present <sup>7</sup>. Ovary mostly superior <sup>8</sup> (inferior in *Helinus*). Fruit usually a fleshy drupe <sup>9</sup>. (Photo <sup>8</sup>: GN).



**DID YOU KNOW:** The San used juice from *Ziziphus mucronata* as a mixing agent for arrow poison, which they obtained from beetle larvae.



*Phylica*

HS

*Phylica*

SPB

*Lasiodiscus*

GN

*Phylica*

ALV

*Phylica*

MK

*Scutia*

MK



*Helinus*

HV



*Phylica*

HS



*Phylica*

MK



*Phylica*

MK



*Ziziphus*

MK



# ROSACEAE

## Rose family

This family is famous for its cultivated flowering and fruiting species and cultivars. It has the highest level of endemism in Asia (20 genera) and North America (17 genera), with only 5 genera endemic to Africa. In southern Africa most members of this family are introduced or naturalised, except for *Cliffortia*, *Leucosidea* and a handful of species in other genera. A number of species are aggressive weeds.

### General information

**Number of genera/species in the world:** 85–122/2 000–3 350.

**Number of genera/species in FSA:** 17/220.

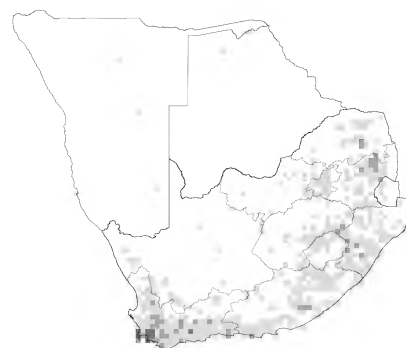
**Well-known FSA genera:** *Cliffortia*, *Geum*, *Leucosidea*, *Prunus*, *Rubus*.

**Growth forms:** Trees, shrubs or climbers; rarely herbaceous.

**Habitats:** In valleys, on mountain slopes, along streams and on disturbed sites.

### Flagship species

*Leucosidea sericea* (ouhout [A]; umtshitshi [Z]) is quite widespread in the eastern parts of South Africa. Trees have gnarled and bent stems and trunks with bark peeling off in strips. Leaves are deeply serrated, dark green above with a prominent furrowed midvein, silky-white below. Flowers are yellow-green and borne in a dense spike. Trees are easy to cultivate and fast-growing; a good choice for small, frost-prone gardens.



### Distribution

Found mainly in the northern temperate regions of the world. In southern Africa *Cliffortia* occurs predominantly in the Western Cape and the other genera in the eastern part of South Africa.

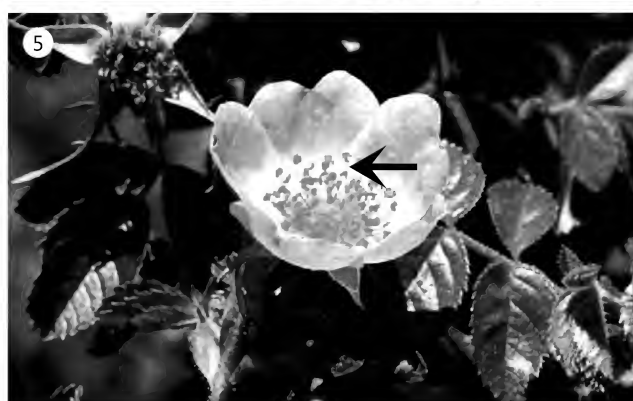
### Significance

The family is best known for its edible fleshy fruits (e.g. apples, peaches, apricots, cherries, strawberries, almonds, raspberries, brambles). It is also known for its attractive ornamentals in gardens, parks and as street trees (e.g. *Rosa*, *Prunus* and *Pyracantha*). Other uses include pectin (from apples), and rose oil (from *Rosa* species). The bark of *Prunus africana* (African almond) is used medicinally. This species occurs throughout tropical Africa and is harvested to such an extent by traditional healers that it is protected in many countries. Several introduced species are noxious weeds (e.g. bramble) in various parts of the world.



## HOW TO IDENTIFY

Stems often with prickles <sup>1</sup>, stipules on twig or on base of petiole <sup>2</sup>. Leaves alternate. Perianth and stamens united at base into a cup (hypanthium) <sup>3</sup>; hypanthium usually well developed with epicalyx, sepals, petals and stamens inserted on its rim, inside usually lined with nectariferous tissue; sepals and petals free <sup>4</sup>; ovary superior to inferior; stamens few to numerous, filaments free <sup>5</sup>.



DID YOU KNOW: Rose oil is one of the most expensive essential oils and Bulgaria is the biggest producer in the world.





*Cliffortia* MK



*Rubus* MK



\**Rosa* MK



*Rubus* MK



*Prunus* GN



*Rubus* MK



*Cliffortia* MK



*Rubus* MK



*Cliffortia* MK



*Cliffortia*

GN



*Prunus*

GN



*Rubus*

MK



*Rubus*

MK



*Leucosidea*

MK



*Cliffortia*

MK



*Cliffortia*

SPB



*Rubus*

MK



*Rubus*

MK



# RUTACEAE

## Buchu family

The family is well known for its variety of citrus fruit but also has some very interesting and attractive representatives in southern Africa. Eleven genera, not resembling citrus fruit at all, are endemic to our area and mainly distributed in the Western Cape. All members of the family have oil glands in the leaves.

### General information

**Number of genera/species in the world:** 160/1 650.

**Number of genera/species in FSA:** 21/301.

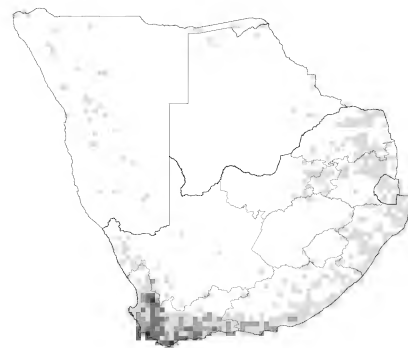
**Well-known FSA genera:** *Acmadenia*, *Adenandra*, *Agathosma*, *Calodendrum*, *Macrostylis*, *Vepris*, *Zanthoxylum*.

**Growth forms:** Mostly trees or shrubs.

**Habitats:** Mainly in fynbos but also in wooded and forest areas.

### Flagship species

*Calodendrum capensis* (Cape chestnut; wildekastaing [A]; umBhaba [Z]) is a deciduous to semi-deciduous tree with large opposite, gland-dotted leaves, which bears large clusters of pink flowers. Flowers have sterile stamens that are petal-like and marked with prominent dark pinkish or reddish glands. Fruit capsules are warted, splitting into 5 segments and releasing large black seeds. When in flower it stands out on wooded ridges and in kloofs and can easily be spotted from a distance. It is also widely planted in gardens as it grows easily from seed and has a non-aggressive root system. The wood is light-coloured and often used for furniture, turning and shelving.



### Distribution

Found in tropical areas in the southern hemisphere, with many endemic genera in South Africa and Australia. Locally, the highest concentration of endemic species is in the Western Cape, whilst the other species are more widespread in the northern, warmer summer-rainfall areas.

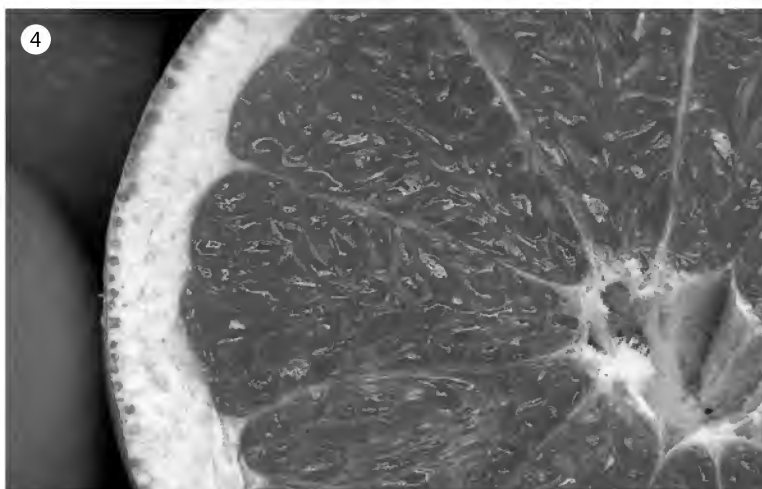
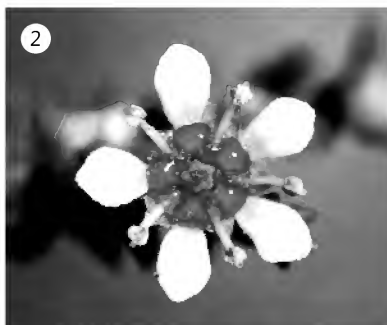
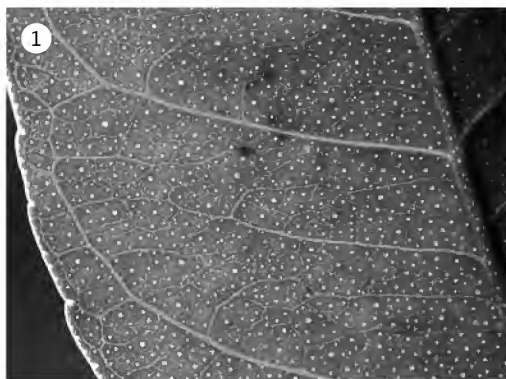
### Significance

Citrus fruit (e.g. oranges, lemons, limes, grapefruit) are widely cultivated in frost-free areas of the world. Essential oils and flavourants are extracted from several buchu species (e.g. *Agathosma betulina*). Buchu is also used in traditional medicine to treat indigestion and ailments of kidneys and the urinary tract and to make buchu brandy. Small knobwood (*Zanthoxylum capense*) is medicinally used for treatment of various aches and pains. Curry leaf (*\*Murraya koenigii*) is an ingredient of Indian curries. Sichuan pepper (*\*Zanthoxylum piperitum*) is used as a spice.



## HOW TO IDENTIFY

Plants aromatic with secretory cavities. Leaves alternate, usually petiolate and dotted with glands <sup>1</sup>. Petals mostly 5 and free <sup>2</sup>; ovary superior <sup>3</sup>. Fruits dehiscent or indehiscent capsules, drupes or berries (citrus fruit is classified as a modified berry, called a hesperidium <sup>4</sup>); in the indigenous members fruit are often deeply lobed and horned <sup>5</sup>.



**DID YOU KNOW:** Brazil ranks first and produces about 21.2% of citrus fruit in the world, whilst South Africa ranks 11th with 1.6%.



*Teclea*

GN

*Calodendrum*

GN

*Acmadenia*

MK

*Agathosma*

MK

*Zanthoxylum*

GN

*Adenandra*

MK

*Oricia*

GN

*Diosma*

MK



*Teclea*

GN



*Diosma*

MK



*Agathosma*

MK

*Agathosma*

MK



*Diosma*

SPB



*Clausena*

GN



*Vepris*

GN



*Zanthoxylum*

GN



*Agathosma*

MK



# SANTALACEAE

## Thesium family

Although members of this family are not always noticed in the veld or bush, they are quite common once you start looking out for them. On the Highveld the small herbs and trees have a characteristic blue-green colour, but they take on all shapes and sizes in the Western Cape.

### General information

Number of genera/species in the world: 36/500.

Number of genera/species in FSA: 5/187.

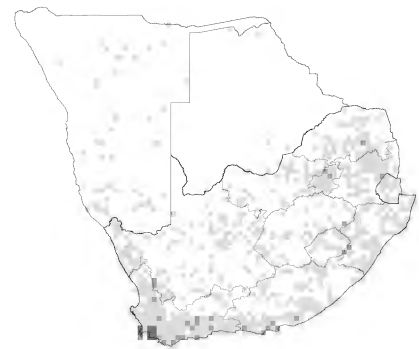
Well-known FSA genera: *Osyris*, *Thesium*, *Thesidium*.

Growth forms: Herbs, shrubs or trees, often hemiparasitic on roots.

Habitats: In grassveld, fynbos and bushveld.

### Flagship species

*Thesium capitatum* is one of the more attractive *Thesium* species. It forms a compact, very densely leafy shrublet that flowers all year round. The leaves are ericoid with a sharp tip, and the small white flowers are borne in clusters at the branch ends. It is restricted to the southern Cape coastal areas.



### Distribution

Widespread in subtropical and temperate regions, often in drier areas, frequently in grassland. A high diversity of species is found in the Western Cape.

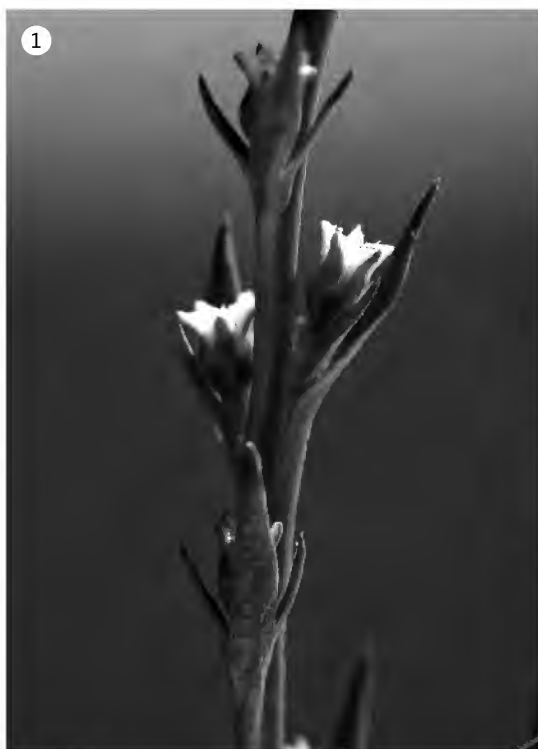
### Significance

The best known member that characterises the family is not found naturally in South Africa although products of *\*Santalum album* (sandalwood tree) are sold commercially. The wood is fragrant, and wooden objects are often sold as scent balls. Sandalwood oil is commonly used in the cosmetics and fragrance industries. *Osyris* species produce bright orange, red or black fruit that are sought after by birds.



## HOW TO IDENTIFY

Usually parasitic on roots of other plants. Leaves alternate or occasionally opposite, greyish or bluish green and leathery <sup>1</sup>. Flowers small <sup>2</sup> without petals, with 3–6 greenish-white sepals <sup>3</sup>; anthers with a tuft of hair. Fruit a nut <sup>4</sup> or drupe <sup>5</sup>, often sticky or brightly coloured and distributed by birds.



**DID YOU KNOW:** Sandalwood holds its fragrance for many years and is one of the oldest incense materials—it has been used for more than 4 000 years.



*Osyris*

SPB

*Thesium*

MK

*Thesium*

MK

*Thesium*

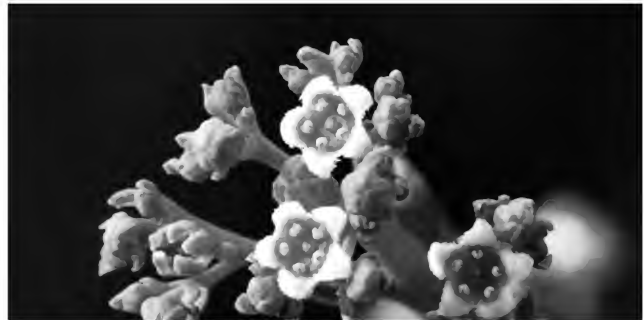
MK

*Thesium*

MK

*Thesium*

MK

*Thesium*

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*Thesium*

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*Thesium*

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*Thesium*

MK



*Osyris*

MK



*Thesium*

MK



*Osyridicarpos*

GN



*Thesium*

MK



*Thesium*

MK



*Thesium*

MK



# STERCULIACEAE

## Star-chestnut family

Members of this family include trees, shrubs, dwarf shrubs and herbs and are usually characterised by the presence of star-shaped hairs. In this contribution the Sterculiaceae is treated at family level, but in recent classifications it is placed within the Malvaceae.

### General information

**Number of genera/species in the world:** ca. 72/ca. 1 500.

**Number of genera/species in FSA:** 7/181.

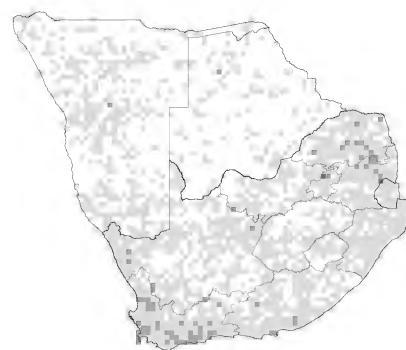
**Well-known FSA genera:** *Cola*, *Dombeya*, *Hermannia*, *Melhania*, *Sterculia*, *Waltheria*.

**Growth forms:** Trees, shrubs, dwarf shrubs and herbs.

**Habitats:** Mostly found in savanna, forest, open scrub and woodland, grassland and arid regions.

### Flagship species

*Sterculia murex* (Lowveld chestnut; Laeveldse kastaiing [A]; mohlatsane [NS]) is an attractive tree 6–12 m high with large palmate leaves, sprays of yellow flowers and sculptured fruit. It makes for an ideal shade tree in tropical and subtropical climates. This tree grows relatively fast, but the soft wood is of little use. Seeds are roasted and eaten as nuts by indigenous people. The fruit is often used as an ashtray. Upon dehiscence of the fruit, the star-like hairs, characteristic of the family, are clearly visible.



### Distribution

Generally cosmopolitan but with higher diversification in the tropical and subtropical regions. In southern Africa it is widely distributed with higher species diversity in the southwestern Cape and Highveld.

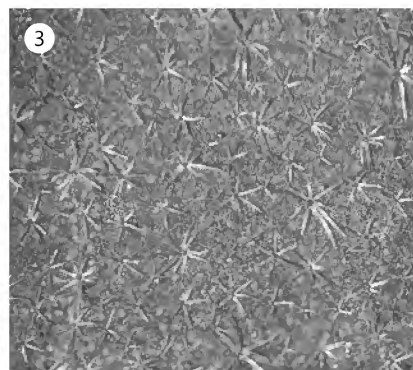
### Significance

The seeds of *Theobroma cacao* are used for the production of chocolate, cacao powder and cacao butter. Many of the species are grown for their ornamental use in gardens (e.g. *Sterculia*). The seeds of *Cola* contain caffeine and theobromine and are used as a stimulant. Some species that yield hard wood are used in the timber industry. Some *Sterculia* species yield gum.



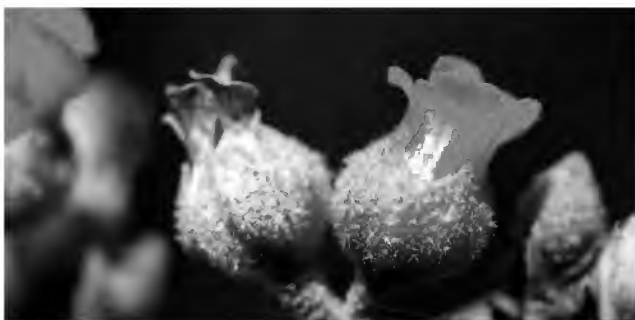
## HOW TO IDENTIFY

Leaves alternate <sup>1</sup>, usually palmately-lobed <sup>2</sup> with star-shaped hairs <sup>3</sup>, stipules present. Flowers regular <sup>4</sup>. Corolla 5, free <sup>5</sup>, twisted in the bud. Anthers 5–15, arranged opposite corolla, free or fused into a short tube; sterile anthers sometimes present. Ovary superior <sup>6</sup> with 1–5 locules. Fruit a capsule <sup>7</sup>. (Photos <sup>4</sup>, <sup>5</sup>, <sup>7</sup>: GN).



**DID YOU KNOW:** Worldwide there are 5–6 million cacao farmers;  
40–50 million people depend on cacao for their livelihood.



*Hemannia*

SPB

*Sterculia*

GN

*Cola*

GN

*Hemannia*

GN

*Hemannia*

SPB

*Hemannia*

SPB

*Dombeya*

GN



*Hermannia*

HV



*Waltheria*

HV



*Hermannia*

SPB



*Hermannia*

SPB



*Dombeya*

GN



*Cola*

GN



*Melhania*

HV



*Hermannia*

SPB



# APOCYNACEAE

## Milkweed family

The family Apocynaceae has many widely differing species ranging from tall trees found in tropical rainforests and the subtropics, to succulent shrubs and small trees growing in tropical, dry and even xeric environments. There are also perennial herbs from temperate zones. Many of these plants have milky sap with some species poisonous if ingested.

### General information

**Number of genera/species in the world:** ca. 480/ca. 4 800.

**Number of genera/species in FSA:** 94/787.

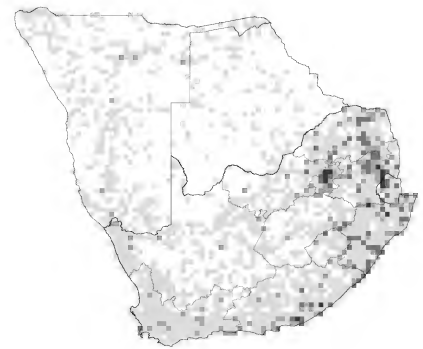
**Well-known FSA genera:** *Adenium*, *Asclepias*, *Brachystelma*, *Carissa*, *Ceropegia*, *Hoodia*, *Pachycarpus*, *Stapelia*, *Xysmalobium*.

**Growth forms:** Herbs, geophytic herbs, climbers, shrubs, trees and succulents.

**Habitats:** Very variable habitats from arid environments to scrub, grassland, savanna, woodland and forest.

### Flagship species

*Pachycarpus schinzianus* (cream cups; bitterwortel [A]) is a perennial herb that resprouts from a rootstock and flowers from October to December. It is a Highveld near-endemic, with its distribution centred in Gauteng. The milky latex is extremely bitter and is rubbed on animal skins before they are set out to dry. People also rub the crushed leaves on their legs to repel dogs. Uzara (this species mixed with *Xysmalobium undulatum*) is a well-known medicine used for diarrhoea, dysentery, to soothe afterbirth cramps and as a tonic for the cardiovascular system.



### Distribution

Mostly found in tropical and warm regions, but also in temperate regions. In southern Africa succulent members are more prevalent in the western, drier areas and the herbaceous members and lianas are more diverse in the moist eastern parts of the region.

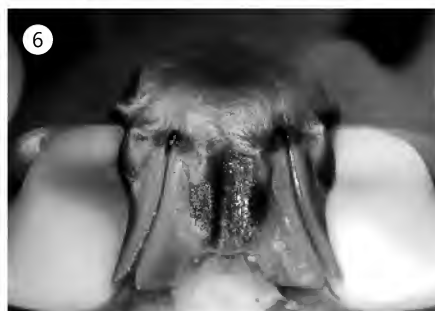
### Significance

Many species are popular garden plants and several genera (e.g. *Adenium* and *Pachypodium*) are grown as ornamental plants. *Landolphia* and other genera have been used as a commercial source of inferior rubber. The sap of *Acokanthera* and some *Pachypodium* species has been used as venom for arrow tips. Some species are sources of important medicinal compounds for treatment of cancer, high blood pressure and even psychosis. A number of taxa are utilised for the fibre contained in the stems and fruit.



## HOW TO IDENTIFY

Plants with watery or milky sap. Leaves mostly opposite <sup>1</sup> or in whorls, without stipules or bracts. Flowers regular <sup>2</sup>, usually in umbels <sup>3</sup>. Corolla 5, fused into a tube; sometimes twisted in the bud <sup>4</sup>; androecium 5, inserted on the tube, sometimes  $\pm$  hidden; anthers arrow-shaped <sup>5</sup> and free or fused into a tube. Stamen fused with style into a column <sup>6</sup>. Corona on central column. Pollen mostly packed together as pollinia <sup>7</sup>. Ovary superior or half-inferior, consists of 2 carpels usually fused only at style. Fruit large, fleshy and solid, or dry follicles, or inflated, usually in divergent pairs <sup>8</sup>. Seed usually with plumes or a tuft of silky hairs <sup>9</sup>.



**DID YOU KNOW:** The compound in *Hoodia gordonii* responsible for the suppression of hunger is nowadays synthesised and used in weight-loss medication and supplements.



*Adenium*

MK

*Rauvolfia*

GN

*Schizoglossum*

SPB

*Pergularia*

GN

*Quaqua*

SPB

*Mondia*

JB

*Hoodia*

MK

*\*Calotropis*

SPB



*Riocreuxia*

SPB



*Ectadium*

SPB



*Strophanthus*

GN



*Asclepias*

SPB



*Aspidonepsis*

SPB



*Xysmalobium*

MK



*Pachycarpus*

SPB



*Ischnolepis*

GN



*Ancylobothrys*

SPB

*Richtersveldia*

SPB

*Orbea*

SPB

*Sarcostemma*

GN

*Pachypodium*

SPB

*Brachystelma*

MK

*Tabernaemontana*

SPB

*Gomphocarpus*

SPB



*Microlooma* MK



*Huernia*

SPB



*Aspidoglossum*

SPB



*Raphionacme* SPB



*Carissa*

GN



*Stapelia*

GN



*Piранthus*

SPB



# ASTERACEAE

(Compositae)  
Daisy family

The family Asteraceae (Compositae) is one of the most familiar plant families in the world. In southern Africa it is also the largest family and is represented by 24 tribes. Of these the Senecioneae and Gnaphalieae are the largest.

## General information

**Number of genera/species in the world:** ca. 1 200/ca. 21 400.

**Number of genera/species in FSA:** 264/2 481.

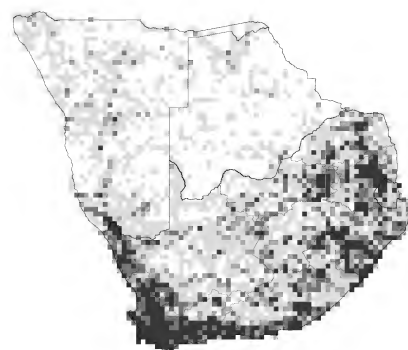
**Well-known FSA genera:** *Berkheya*, *Euryops*, *Felicia*, *Helichrysum*, *Othonna*, *Senecio*.

**Growth forms:** Generally annual or perennial herbs, subshrubs or shrubs. There are some climbers or lianas, a number of small trees and epiphytes; very rarely aquatic.

**Habitats:** Found in almost all types of habitats and at all altitudes, from coastal beaches to the highest seasonally snow-capped mountains.

## Flagship species

There are numerous examples of daisies that are unique to southern Africa but none of them has caught the imagination as much as *Dimorphotheca sinuata* (Namaqualand daisy; jakkalsblom [A]). This daisy contributes greatly to the annual flower displays in Namaqualand. It is recognised by its flattened, winged seeds and salmon or orange ray florets. Plants are annual, up to 400 mm tall and are pioneers on disturbed soils.



## Distribution

One can find members of the Asteraceae everywhere in the world, except in Antarctica. It is found throughout southern Africa with the highest concentrations in the winter-rainfall area, and in the mountainous and subtropical areas of eastern South Africa.

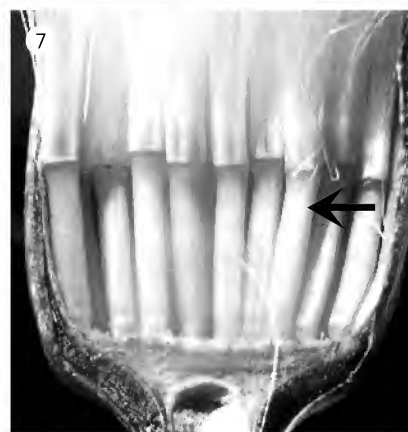
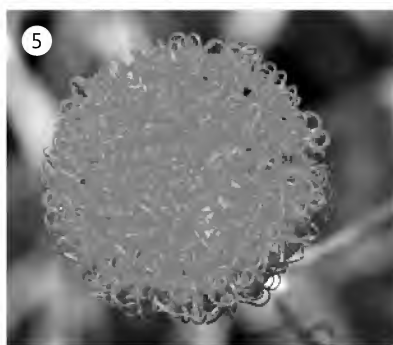
## Significance

Asteraceae species are known for a wide variety of reasons: food plants (lettuce, artichokes, sunflower); oil producers (sunflower, safflower); herbs (tarragon); ornamentals (asters, chrysanthemums, dahlias, cosmos, marigolds); insecticide (pyrethrum); medicines and herbal remedies (arnica, calendula, chamomile, tansy); and drugs (artemisinin). One of the best-known South African daisies, *Gerbera jamesonii* (Barberton daisy), has been cultivated for many years and the breeding has led to over 900 varieties being available in worldwide trade. It is sold as pot plants but has gained popularity as cut flower and ranks 5th in the world today.



## HOW TO IDENTIFY

Presence of a flowerhead (capitulum) <sup>1</sup>, which consist of one or many flowers (florets) <sup>2</sup> surrounded by a series of protective bracts (involucre) <sup>3</sup>. Anthers usually 5, joined into a collar <sup>4</sup>. Heads can be discoid <sup>5</sup> or radiate <sup>6</sup>, with disc florets and/or ray florets. Ovary inferior <sup>7</sup> with 1 locule. Calyx modified into a pappus <sup>8</sup>.



**DID YOU KNOW:** *Oldenburgia grandis* is one of the few indigenous Asteraceae species classified as a tree; it grows to 6 m tall and has flowerheads of 100–150 mm in diameter.



## Tribe Senecioneae

By far the largest tribe in the family, with 150 genera and 3 500 species in the world and 23 genera and 648 species in southern Africa. Involucre is commonly green and in one series, with or without a few much smaller outer bracts (calyculus); bracts are free or connate to various degrees; cypselae mostly cylindrical; pappus of bristles.

Well-known FSA genera: *Cineraria*, *Euryops*, *Kleinia*, *Othonna*, *Senecio*.



*Euryops*

MK



*Senecio*

MK



*Othonna*

MK



*Senecio*

SPB



*Euryops*

MK



*Senecio*

MK



*Senecio*

MK



*Lopholaena*

MK



*Euryops*

MK



*Senecio*

MK



*Senecio*

MK



*Othonna*

MK



*Senecio*

MK



*Senecio*

MK



*Euryops*

MK



## Tribe Gnaphalieae

The second largest tribe in southern Africa, with 61 genera and 586 species, worldwide with 185 genera and 1 240 species. Over 90% of the FSA species are endemic to the region. Capitula solitary or in secondary heads; involucre bracts in several rows and papery, brownish or brightly coloured, but not green; cypselae small and pappus bristles plumose or scabrid.

Well-known FSA genera: *Athrixia*, *Helichrysum*, *Macowania*, *Metalasia*, *Oedera*, *Relhania*.



*Disparago*

MK



*Gnaphalium*

MK



*Artemisiopsis*

MK



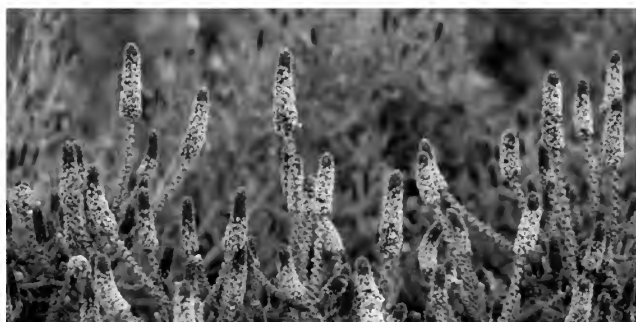
*Helichrysum*

MK



*Callilepis*

MK



*Stoebe*

MK



*Metalasia*

MK



*Helichrysum*

MK



*Stoebe*

MK



*Athrixia*

MK



*Phaenocoma*

MK



*Edmondia*

MK



*Ifloga*

MK



*Dolichothrix*

MK



*Tenrhynea*

MK



*Macowania*

MK



## Tribe Anthemideae

A fairly large tribe in the world, with 111 genera and 1 800 species. In southern Africa a sizable tribe with 35 genera and 313 species, of which many are endemic. Leaves usually glandular and aromatic; capitula discoid or radiate, mostly pedunculate, solitary or in corymbs, panicles or small compact clusters.

Well-known FSA genera: *Athanasia*, *Cotula*, *Eriocephalus*, *Osmitopsis*, *Pentzia*, *Ursinia*.



*Artemisia*

MK



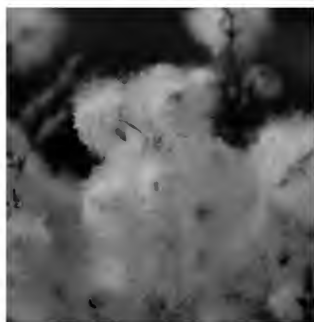
*Eumorphia*

MK



*Athanasia*

MK



*Eriocephalus*

MK



*Hymenolepis*

MK



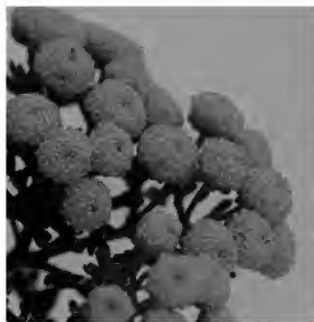
*Ursinia*

MK



*Eriocephalus*

MK



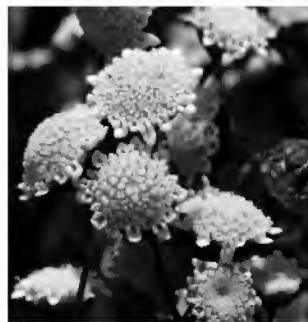
*Oncosiphon*

MK



*Ursinia*

MK



*Cotula*

MK



*Ursinia*

MK

## Tribe Arctotideae

Most of the 25 genera and 235 species in this medium-sized tribe are endemic to southern Africa. Leaves entire, lobed or divided to the midrib, with or without small spines. Capitula usually radiate; cypselae mostly hairy; pappus of scales.

Well-known FSA genera: *Arctotis*, *Berkheya*, *Didelta*, *Gazania*, *Gorteria*, *Hirpicium*.



*Hirpicium*

MK



*Arctotheca*

MK



*Gazania*

MK



*Arctotheca*

MK



*Arctotheca*

MK



*Gorteria*

MK



*Arctotis*

MK



*Berkheya*

MK



*Berkheya*

MK



## Tribe Astereae

A large tribe worldwide, with 205 genera and 3 080 species. In southern Africa the fourth largest with 23 genera and 302 species. Leaves usually alternate; capitula many-flowered; involucre bracts usually in 3–5 series, often herbaceous, usually persistent and bent downwards; cypselae laterally compressed.

Well-known FSA genera: *Amellus*, *Chrysocoma*, *Conyza*, *Felicia*, *Pteronia*.

*Felicia*

MK

*Pteronia*

MK

*Pteronia*

MK

*Felicia*

MK

*Amellus*

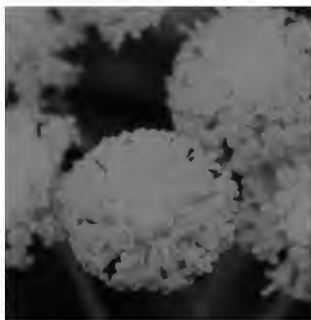
MK

*Doellia*

MK

*Pteronia*

MK

*Chrysocoma*

MK

*Felicia*

MK

*Conyza*

MK

## Tribe Calenduleae

This tribe is almost entirely endemic to southern Africa and has 12 genera and 118 species. Capitula solitary or corymbose, radiate; cypselae often winged, those of outer florets usually curved, those of *Chrysanthemoides* a drupe without pappus.

Well-known FSA genera: *Chrysanthemoides*, *Dimorphotheca*, *Osteospermum*, *Tripteris*.



*Dimorphotheca*

MK



*Tripteris*

MK



*Chrysanthemoides*

MK



*Dimorphotheca*

MK



*Chrysanthemoides*

MK



## Tribe Chichorieae

This tribe is represented by 14 genera and 53 species (mostly weeds) in southern Africa, but has a much larger representation (86 genera and 1 500 species) in the world. Capitula ligulate; milky latex present; florets with 5 lobes.

Well-known FSA genera: *\*Cichorium*, *\*Hypochaeris*, *\*Lactuca*, *Sonchus*, *\*Taraxacum*.



*\*Taraxacum*

MK



*\*Cichorium*

MK



*\*Hypochaeris*

MK



*Sonchus*

MK



*\*Youngia*

MK

## Tribe Heliantheae

The tribe with 113 genera and 1 500 species worldwide includes some well-known species, such as sunflowers. In southern Africa it is mostly represented by weeds and cultivated plants in 22 genera and 40 species. Herbs; leaves opposite; capitula radiate with large white, yellow or orange corollas; involucre bracts in 1 or 2 rows; cypselae with a black layer in the fruit wall.

Well-known FSA genera: *\*Helianthus*, *\*Tithonia*, *\*Verbesina*, *\*Zinnia*.



*\*Zinnia*

MK



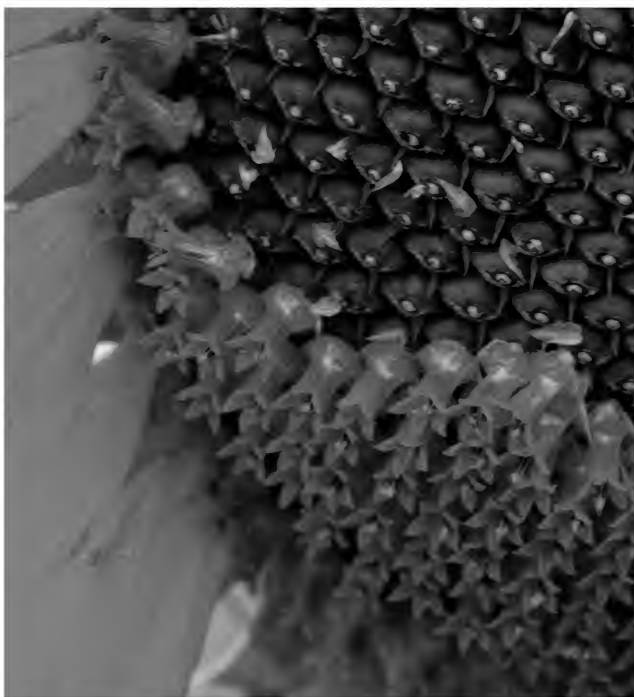
*\*Helianthus*

MK



*\*Acanthospermum*

MK



*\*Helianthus*

MK



*\*Galinsoga*

MK



*\*Tithonia*

MK



## Tribe Vernonieae

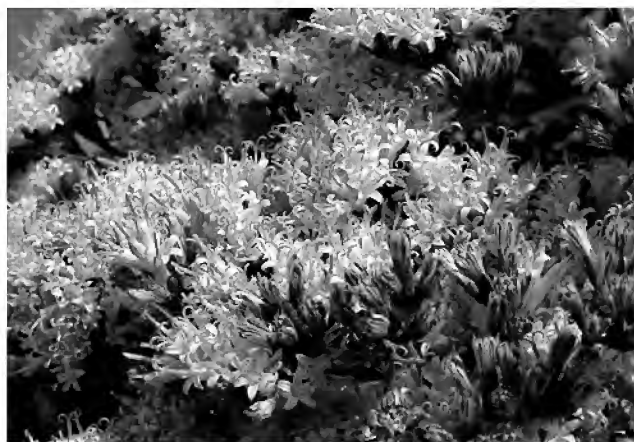
In southern Africa there are 15 genera and 87 species in this tribe, while there are 130 genera and 1 600 species in the world. Leaves usually alternate and the blade undivided; inflorescences cymes, corymbiform with cymose branches; capitula discoid; involucre bracts in 3–9 series; florets 1–400, mostly purple.

Well-known FSA genera: *Hilliardiella*, *Orbivestus*, *Polydora*, *Vernonia*.



Vernonia

MK



Gymnanthemum

GN



Vernonia

GN



Vernonia

MK



Baccharoides

MK

## Tribe Dicomeae

The tribe has 7 genera and 97 species in the world and 3 genera and 28 species in southern Africa. Capitula discoid; disc florets with relatively long lobes; involucre bracts in many series, often spiny.

Well-known FSA genera: *Dicoma*, *Macleodium*.



*Dicoma*

MK



*Dicoma*

MK



*Macleodium*

MK



*Macleodium*

MK

## Tribe Coreopsideae

A small tribe with only 3 well-known genera and 7 species in southern Africa, and 30 genera and 550 species in the world. Leaves commonly dissected, 1–3-pinnatifid; involucre bracts dimorphic, in 1–6 series, herbaceous, green; pappus of 2 or 3 awns, awns smooth or barbed.

Well-known FSA genera: *Bidens*, \**Coreopsis*, \**Cosmos*.



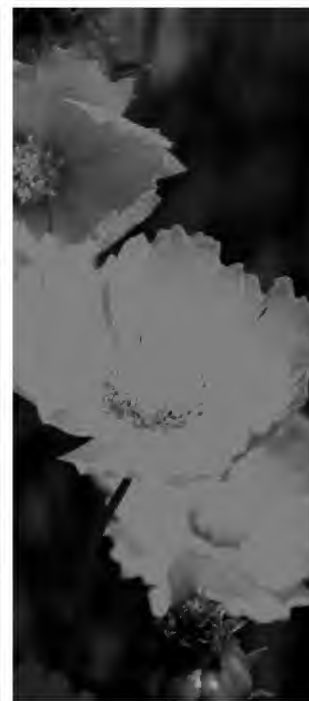
\**Cosmos*

MK



*Bidens*

MK



\**Coreopsis*

MK



## Tribe Inuleae

This tribe is more prolific in the world (66 genera and 687 species), than in southern Africa where 19 genera and 74 species are known. Capitula solitary; involucre bracts generally in many rows, herbaceous or cartilaginous; pappus mostly of capillary bristles.

Well-known FSA genera: *Calostephane*, *Geigeria*, *Pegolettia*.



*Pegolettia*

MK



*Laggera*

GN



*Geigeria*

MK



*Calostephane*

MK

## Tribe Mutisieae

(*sensu stricto*)

This tribe is only represented by 2 genera and 16 species in southern Africa. In the world (mainly South America and the Andes) there are 82 genera and 950 species. Style arms short-papillose; florets usually 2-lipped.

Well-known FSA genera: *Gerbera*, *Perdicium*.



*Gerbera*

MK



*Gerbera*

MK



*Gerbera*

MK



*Gerbera*

MK

## Tribe Athroismeae

The world has 6 genera and 59 species in this tribe, which is represented in southern Africa by only 1 genus and 4 species. Capitula radiate; ray florets pistillate; cypselae black or brown.

Well-known FSA genus: *Anisopappus*.



*Anisopappus*

MK

## Tribe Cardueae

A tribe of 73 genera and 2 360 species in the world, but only known in southern Africa in 8 genera and 14 species, which are mostly weedy. Leaves alternate, frequently in basal rosettes; involucre bracts in many rows, usually spiny; latex present in aerial parts.

Well-known FSA genera: *\*Carduus*, *\*Cirsium*.



*\*Cirsium*

MK

## Tribe Corymbieae

This tribe has only one genus with 14 species endemic to the Western Cape. Scapose perennial with stout rhizome; leaves linear-lanceolate, parallel-veined; capitula discoid, single-flowered, in corymb or panicle; pappus of short scales or delicate fine bristles.

Well-known FSA genus: *Corymbium*.



*Corymbium*

MK

## Tribe Eremothamneae

The 2 genera and 3 species of this tribe are endemic to southern Africa. Leaves spinose; florets yellow; style with rather long sweeping hairs.

Well-known FSA genera: *Eremothamnus*, *Hoplophyllum*.



*Hoplophyllum*

MK



*Eremothamnus*

MK



## Tribe Eupatorieae

This tribe is quite prolific in the world with 182 genera and about 2 200 species. In southern Africa it is infamous for its invasive properties and is represented by 7 genera and 13 species. Plants scandent; leaves usually opposite; cypselae with a black layer in the fruit wall.

Well-known FSA genera: *\*Ageratum*, *\*Campuloclinium*, *\*Chromolaena*.



*\*Ageratum*

MK



*\*Campuloclinium*

MK

## Tribe Helenieae

A small tribe of 4 genera and 5 species in southern Africa, and 13 genera and 120 species in the world. Capitula radiate or discoid; involuclral bracts subequal to graded; pappus of a few minute scales or absent.

Well-known FSA genera: *\*Gaillardia*, *\*Flaveria*, *\*Hypericophyllum*, *\*Schkuhria*.



*\*Schkuhria*

MK



*\*Flaveria*

MK

## Tribe Oldenburgieae

Endemic to southern Africa and has only one genus with 4 species. Leaves thick and leathery; capitula urn-shaped or almost hemispherical; ray florets 2-lipped; pappus bristles long, barbed.

Well-known FSA genus: *Oldenburgia*.



*Oldenburgia*

MK



*Oldenburgia*

MK

## Tribe Platycarphaeae

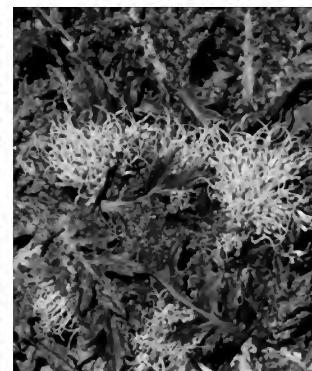
The 2 genera and 3 species of this tribe are endemic to southern Africa. Prostrate, stemless, clonal herbs; florets grouped in secondary heads surrounded by one or more rosettes of leaves; florets dark or light mauve to white.

Well-known FSA genera: *Platycarpha*, *Platycarphella*.



*Platycarphella*

MK



*Platycarpha*

MK

## Tribe Tageteae

There are 32 genera and 270 species of this tribe in the world. In southern Africa there is only 1 genus with 2 species. Commonly known as khakibos and probably one of the most common weeds. Capitula cylindric; involucre bract in 1 or 2 series; ray florets 1 or 2 per head; pappus of scales.

Well-known FSA genus: *\*Tagetes*.



*\*Tagetes*

MK

## Tribe Tarchonantheae

A small tribe endemic to FSA, with 2 genera and 16 species. Dioecious trees or shrubs; capitula unisexual, discoid or disciform; pappus absent or of barbed setae.

Well-known FSA genera: *Brachylaena*, *Tarchonanthus*.



*Tarchonanthus*

MK



*Brachylaena*

MK

## Genus *Heterolepis*

(unplaced in a tribe)

This seemingly unrelated genus has 3 species and is endemic to southern Africa. Capitula pedunculate, radiate; involucre bracts in 2 or 3 rows; pappus of barbed bristles.

Well-known FSA genus: *Heterolepis*.



*Heterolepis*

MK



*Heterolepis*

MK



# BORAGINACEAE

(including Hydrophyllaceae)  
Forget-me-not family

Although this family is probably better known for its beautiful exotic garden plants and as an interesting addition to salads, there are some very attractive and colourful indigenous species. The classification of the family Boraginaceae is still somewhat problematic. In some systems the family is split up into several families.

## General information

**Number of genera/species in the world:** ca. 153/ca. 2 775.

**Number of genera/species in FSA:** 20/120.

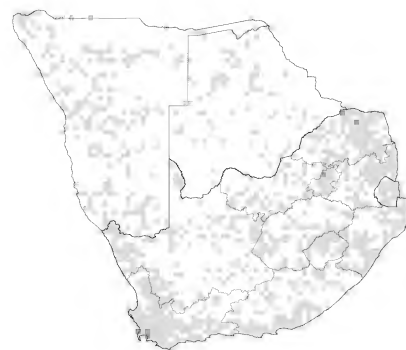
**Well-known FSA genera:** *Cordia*, *Ehretia*, *Heliotropium*, *Lobostemon*, *Myosotis*, *Trichodesma*.

**Growth forms:** The southern African species are mostly annual or perennial herbs or shrubs and a few small trees, while there are some large trees in the tropics.

**Habitats:** On sandy soils in the Western Cape; and in grassland and bushveld to the north. Weedy species are mostly found on disturbed soils.

## Flagship species

*Trichodesma physaloides* (chocolate bells; slangkop [A]) is a very characteristic species of the grassland and flowers prolifically after fire. It is characterised by the large, dark purplish brown bracts and white, pendulous flowers that grace the tops of the small compact shrubs. Leaves are lance-shaped, grey-green and smooth.

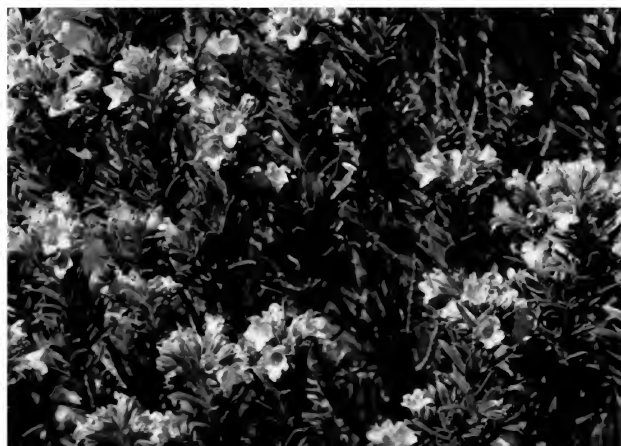


## Distribution

In southern Africa the family is well represented and has higher densities in the eastern and western regions than in the central parts. In the rest of the world many of the tree species are tropical, while the herbaceous genera are widespread, especially in the Mediterranean.

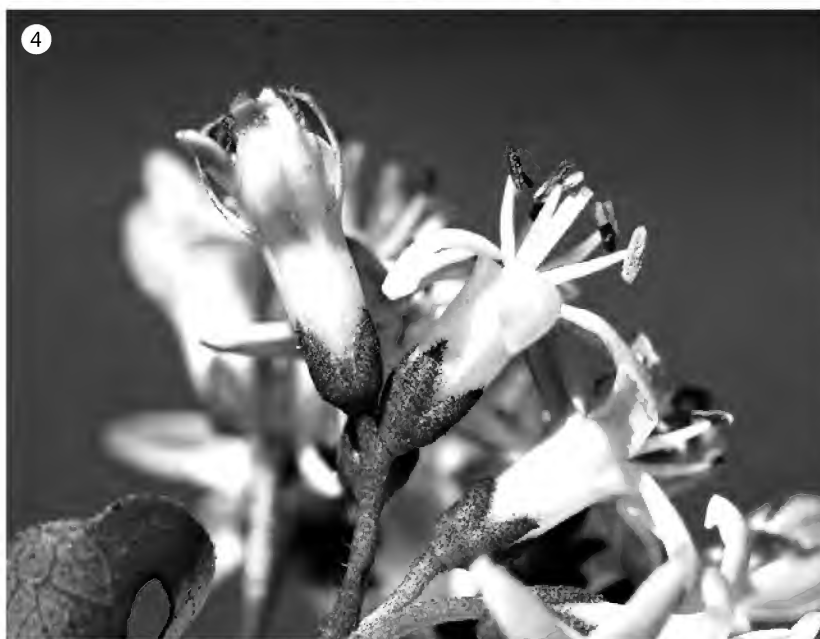
## Significance

The indigenous *Lobostemon* (agdaegeneesbos, douwurmbos [A]) is used for dressing sores or in a decoction as an antiseptic. *Ehretia rigida* (puzzle bush; deurmekaarbos [A]) bears orange berries, which attract birds, and the branches are pliable and used to make bows and baskets. Several exotic or naturalised species are well known as ornamentals: *Myosotis* (forget-me-not), *\*Symphytum* (comfrey), *Lithospermum* (stoneseed), *Heliotropium* (heliotrope). Comfrey is mixed into an ointment for sprains, arthritis, bruises and cuts. *\*Echium plantagineum* (blueweed; bloudissel [A]) is an undesirable, invasive weed, which is poisonous to livestock.



## HOW TO IDENTIFY

Leaves usually alternate <sup>1</sup>, often bristly with conspicuous stiff hairs <sup>2</sup> that are usually unicellular and mounted on a multicellular base. Inflorescence 1-sided and coiled <sup>3</sup>; corolla usually tubular to trumpet-shaped <sup>4</sup>, regular <sup>5</sup>; petals fused, often with outgrowths; ovary superior, 4-lobed with 4 ovules. Fruit often a schizocarp splitting into four 1-seeded nutlets <sup>6</sup>.



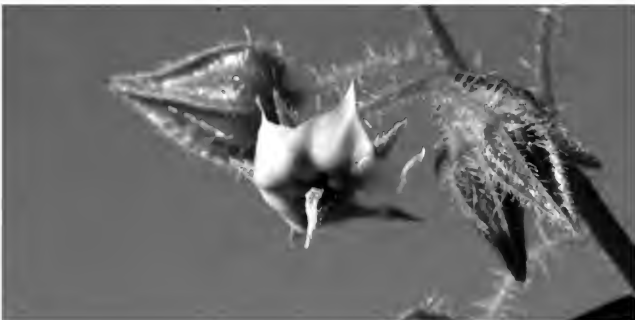
DID YOU KNOW: \**Symphytum* (comfrey) can be used as compost activator.





*Anchusa*

MK



*Trichodesma*

MK



*Myosotis*

MK



*Heliotropium*

MK



*Echium*

MK



*Cordia*

GN



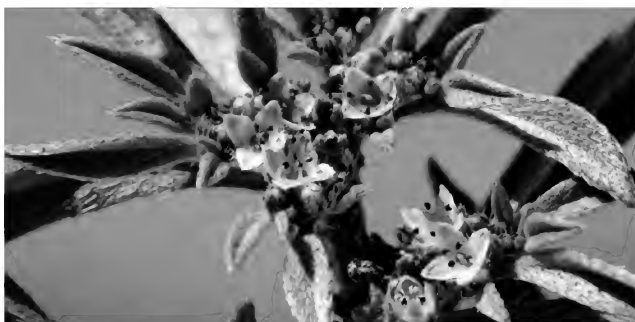
*Ehretia*

MK



*Trichodesma*

SPB



*Wellstedtia*

MK



*Lobostemon*

SPB



*Lithospermum*

SPB



*Ehretia*

MK



*Cynoglossum*

MK



*Cordia*

GN



*\*Amsinckia*

MK



*Trichodesma*

SPB



*Lobostemon*

MK



# CAMPANULACEAE

(excluding Lobeliaceae)  
Bell flower family

A cosmopolitan family of mostly herbs with relatively large, showy flowers predominantly blue in colour; some genera are endemic to South Africa (*Merciera*, *Roella*, *Theilera*).

## General information

**Number of genera/species in the world:** ca. 50/ca. 1 046.

**Number of genera/species in FSA:** 12/260.

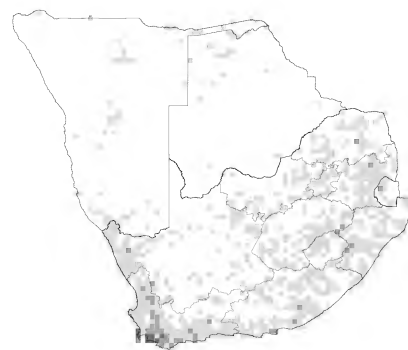
**Well-known FSA genera:** *Prismatocarpus*, *Wahlenbergia*.

**Growth forms:** Mostly annual and perennial herbs or shrublets, seldom shrubs or trees.

**Habitats:** Mostly found in open habitats, e.g. grassland, fynbos and semi-arid regions; from mountaintops to coastal flats.

## Flagship species

*Craterocapsa tarsodes* (carpet bell flower) is a mat-forming herb with lance-shaped leaves and bell-shaped flowers. The stems are short, ending in rosettes of leaves. The blue or white flowers are borne in the axils of the leaves during summer. This species is found on rocky outcrops and stony grassland all along the Drakensberg escarpment between altitudes of 1 200 and 2 500 m. (Photo: JK).



## Distribution

Found mainly in the temperate zone of the northern hemisphere with fewer species in South America, southern Africa and Australasia. Within southern Africa the family is widespread with the highest diversity in the Western Cape.

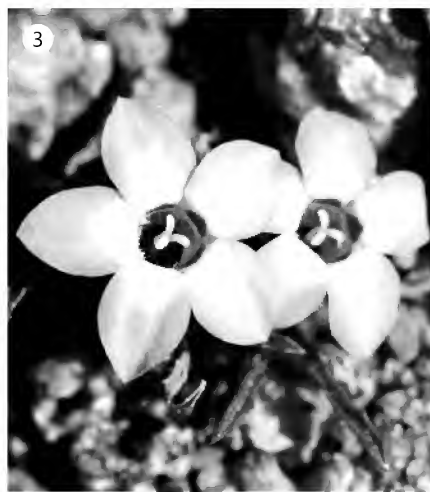
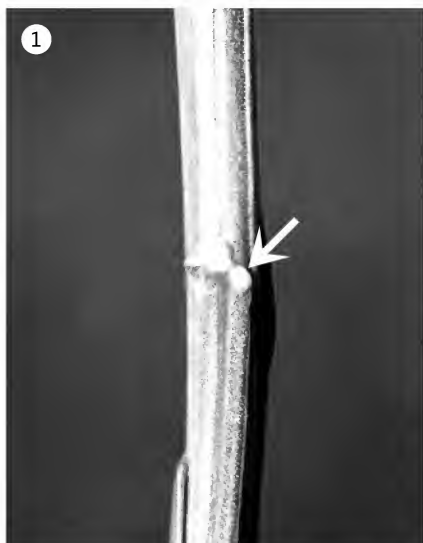
## Significance

Members of the family are used as garden ornamentals (*\*Campanula*, *\*Symphyandra*, *Wahlenbergia*). In the past, a few *Wahlenbergia* species were used as a vegetable in Europe. In Chinese medicine the roots of *\*Codonopsis* are used as a tonic. Traditional use of *Wahlenbergia* in southern Africa includes treatment of stomach ailments and use as protective charms. In Namaqualand, *Wahlenbergia* species contribute considerably to the flower display during spring, especially towards the end of the flowering season.



## HOW TO IDENTIFY

Plants usually contain milky latex <sup>1</sup>. Leaves simple, mostly alternate without stipules <sup>2</sup>. Regular flowers <sup>3</sup> borne in racemes or cymes; flowering parts usually pentamerous with the bell-shaped corolla consisting of 5 fused petals <sup>4</sup>. Anthers free <sup>5</sup>. Calyx tube fused with the inferior ovary <sup>6</sup>, often crowned by an annular nectary. Fruit usually a dehiscent capsule (indehiscent in *Merciera*), often crowned by persistent calyx lobes <sup>7</sup>, rarely a berry.



**DID YOU KNOW:** The corolla lobes show 'sleeping' movements—flowers open at midmorning and close in late afternoon. Some wasps and bees use the closed flowers for shelter during the night.



*Craterocapsa*

MK

*Wahlenbergia*

MK

*Wahlenbergia*

JK

*Roella*

SPB

*Roella*

MK

*Wahlenbergia*

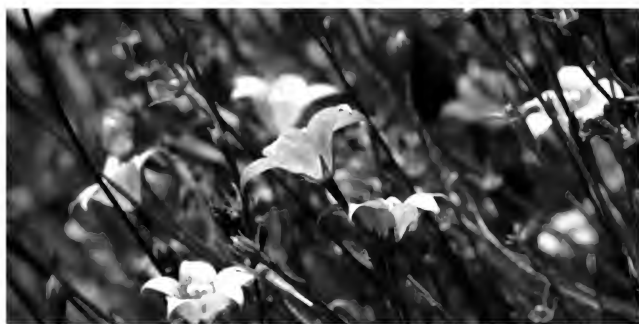
MK

*Wahlenbergia*

SPB

*Wahlenbergia*

MK

*Wahlenbergia*

MK



*Wahlenbergia*

MK



*Roella*

JK



*Wahlenbergia*

ALR



*Roella*

SPB



*Wahlenbergia*

MK



*Pristocarpus*

MK



*Wahlenbergia*

SPB



# CONVOLVULACEAE

(including *Cuscuta*)  
Morning glory family

The common name, morning glory, is very appropriate for this family. In the mornings the flowers are conspicuous and striking, but they soon fade in the heat of the day and one will often find only wilted, closed flowers in the afternoon. In alternative classifications *Cuscuta* (dodder) is placed in its own family.

## General information

**Number of genera/species in the world:**  $\pm 62/\pm 1\ 700$ .

**Number of genera/species in FSA:** 16/115.

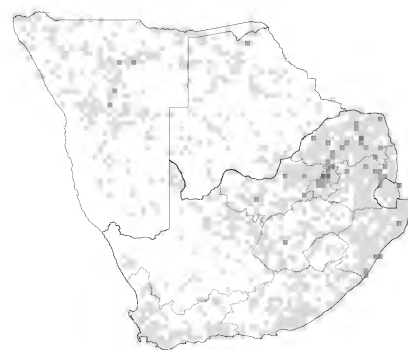
**Well-known FSA genera:** *Convolvulus*, *Cuscuta*, *Evolvulus*, *Ipomoea*, *Merremia*.

**Growth forms:** Shrubs or herbs, usually with long, trailing or twining stems, or leafless parasitic herbs.

**Habitats:** In temperate and tropical regions of the world, dry Mediterranean and semi-desert climates and disturbed areas.

## Flagship species

*Ipomoea ommanneyi* (beespatat [A]) is a vigorous grower with numerous stems growing in all directions from a large tuberous taproot. Young stems grow very quickly outwards and bear large sword-shaped, densely hairy leaves, which stand upright and often face in the same direction. Flowers are pink. The roots are used medicinally to treat convulsions or as an aphrodisiac. Traditionally used by Zulu people in times of famine, often mixed with curdled milk to increase its bulk. This species is widespread in the northern provinces of South Africa and can also be found further north.



## Distribution

This cosmopolitan family has a higher concentration of species in the warmer regions of the world. The highest density of species in southern Africa is found in the northeastern region.

## Significance

Leaves and starchy tuberous roots of some species are eaten (e.g. water spinach and sweet potato) and are very good and versatile food sources. Some members are well known as showy garden plants, e.g. *\*Convolvulus cneorum* (silver bush), *\*Ipomoea purpurea* (common morning glory), *\*Ipomoea quamoclit* (Cypress vine) and *\*Stictocardia beraviensis* (Madagascar convolvulus).



## HOW TO IDENTIFY

Shrubs or climbing herbs with long thin trailing stems <sup>1</sup>; milky latex often present <sup>2</sup>. Leaves alternate, lobed or heart-shaped <sup>3</sup>. Flowers trumpet-shaped with 5 fused petals and distinct pleats in the corolla <sup>4</sup>; petals are twisted in the bud <sup>5</sup>; 5 stamens, fused to base of flower; ovary superior. Fruit mostly a 4-seeded capsule <sup>6</sup>.



**DID YOU KNOW:** *Ipomoea pes-caprae* (dune morning glory; sandpatat [A]), commonly found along our beaches, helps to stabilise the sand dunes.





*Ipomoea*

GN



*Ipomoea*

MK



*Xenostegia*

MK



*Ipomoea*

GN



*Ipomoea*

GN



*Ipomoea*

MK



*Convolvulus*

SPB



*Merremia*

MK

CONVOLVULACEAE



*Convolvulus*

MK



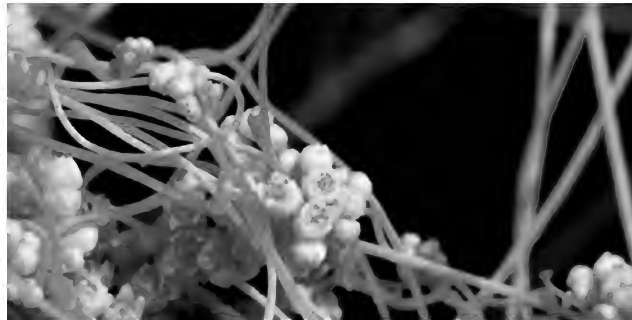
*Ipomoea*

JF



*Merremia*

MK



*Cuscuta*

MK



*Ipomoea*

SPB



*Evolvulus*

MK



*Ipomoea*

MK



*Ipomoea*

MK



# CRASSULACEAE

## Crassula family

A diverse family of mostly succulent plants preferring dry, rocky habitats worldwide; almost absent from humid tropics. Some members are highly sought after by succulent plant collectors.

### General information

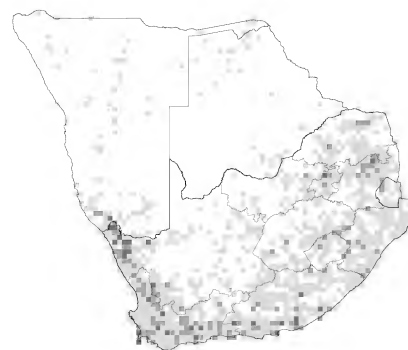
**Number of genera/species in the world:** ca. 34/ca. 1 410.

**Number of genera/species in FSA:** 6/430.

**Well-known FSA genera:** *Cotyledon*, *Crassula*, *Tylecodon*.

**Growth forms:** Herbs and small shrubs, usually succulent.

**Habitats:** Characteristic of exposed, rocky areas with a few species adapted to frost-hardy and even aquatic habitats.



### Distribution

Found throughout the world, but especially in warm, dry areas with centres of diversity in Mexico and South Africa. In southern Africa the highest diversity is found in mountainous areas in the more arid parts of the region.

### Flagship species

*Cotyledon orbiculata* (pig's ear; plakkie [A]; serilele [SS]; ipewula [X, Z]) is a widespread species found throughout southern Africa. It is a small shrub with woody branches and thick, succulent leaves. The leaves usually have a reddish margin and are covered with a waxy layer. The flowers are tubular, orange or red and borne on a long stalk. The leaves and leaf juice are used to treat corns and warts, earache, boils and inflammation. This plant also causes krimpsiekte (shrinking disease) in livestock.

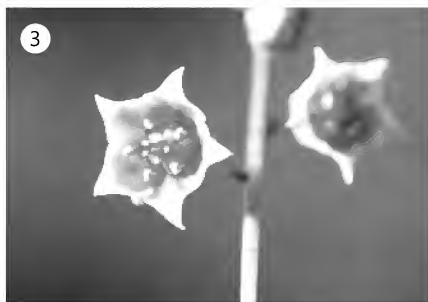
### Significance

Members of the family are widely cultivated as ornamentals in rock gardens or as collector's items (*Cotyledon*, *Crassula*, *Kalanchoe*, *Tylecodon*). Some species are used medicinally or as love charms but certain genera are toxic (*Cotyledon*, *Tylecodon*) causing krimpsiekte, a major cause of livestock losses, especially in arid areas. Larvae of the tailed black-eye butterfly feed on crassulas. An abundance of some *Cotyledon* species indicates mismanaged veld.



## HOW TO IDENTIFY

Leaves opposite <sup>1</sup> or spirally arranged, rarely whorled, often in basal rosettes <sup>2</sup>, succulent with no stipules. Flowers mostly regular <sup>3</sup> with 4 or 5 (sometimes more) free or basally connate sepals and 4 or 5 (sometimes more) petals, free or connate to form a corolla tube <sup>4</sup>. Flowers small but borne in showy corymbs or panicles <sup>5</sup>. Ovary superior <sup>6</sup>, with 3 to 5 separate carpels (sometimes slightly joined at the base). A nectar gland <sup>7</sup> is present at the base of each carpel. Fruit usually a head of free follicles <sup>8</sup> enclosed by dry petals. (Photo <sup>2</sup>: ALV; <sup>6</sup>: GN).



**DID YOU KNOW:** Members of this family are easily propagated from cuttings, leaves or adventitious buds.



*Adromischus*

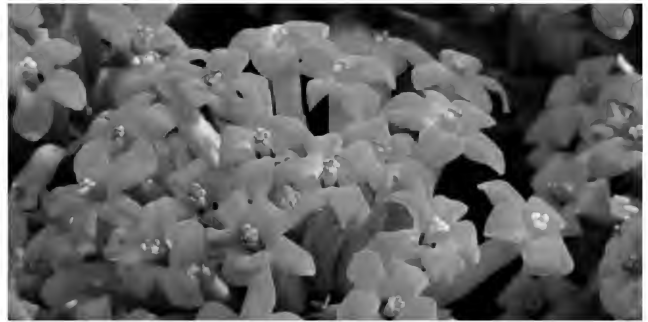
SPB

*Crassula*

MK

*Tylecodon*

JB

*Crassula*

MK

*Crassula*

JK

*Kalanchoe*

JK

*Crassula*

GN



*Cotyledon*

JK



*Crassula*

MK



*Crassula*

EE



*Crassula*

RDV



*Crassula*

JK



*Crassula*

SPB



*Crassula*

PMB



*Kalanchoe*

GN



# CUCURBITACEAE

## Cucumber family

A family of annual and perennial climbers or creepers, usually with tendrils and a rough indumentum. Many species are cultivated and of economic importance as food plants, including pumpkin, watermelon, cucumber and melon.

### General information

**Number of genera/species in the world:** ca. 120/ca. 735.

**Number of genera/species in FSA:** 16/78.

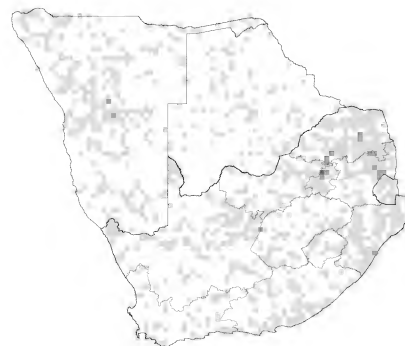
**Well-known genera in FSA:** *Citrullus*, *Coccinia*, *Cucumis*, *Gerrardanthus*, *Kedrostis*, *Lagenaria*, *Momordica*, *Peponium*, *Trochomeria*, *Zehneria*.

**Growth forms:** Mostly annual or perennial climbing or creeping herbs or shrubs, which may be monoecious or dioecious.

**Habitats:** Found in woodland, grassland, savanna, desert and semi-desert areas.

### Flagship species

*Cucumis metuliferus* (African horned cucumber; rooikomkommer [A]; mokapana [T]) is a highly ornamented and attractive member of the family which is widely cultivated as a food plant and sought after by plant collectors as a curiosity. The fruit varies in degree of bitterness and is eaten raw or cooked and the sap drained as a source of water. The leaves are sometimes cooked as a type of spinach. In the folklore of some of the traditional tribes the pounded roots mixed with other compounds are used to ward off evil spirits and ghosts. (Photo: GN).



### Distribution

Mainly in moist to dry tropical and subtropical regions. In southern Africa this family is best represented in KwaZulu-Natal, on the Mpumalanga escarpment, and the Highveld.

### Significance

The family is important in agriculture where mostly the fruit (and sometimes the leaves) are used as a source of food. These include cucumber, gherkins, melon, pumpkin, squashes, watermelon and zucchini. Many indigenous inhabitants of the drier areas in Africa, both man and beast, use fruit of the tsamma (*Citrullus lanatus*) and narras (*Acanthosicyos* species) as a source of food and water. Many species of gourds (*Lagenaria*) have been used as containers and as medicines.



## HOW TO IDENTIFY

Mostly herbs with trailing stems <sup>1</sup> (creepers and climbers). Leaf axils usually carry lateral and sometimes branched tendrils <sup>2</sup>. Stems and alternate leaves <sup>3</sup> covered in rough hairs. Leaves without bracts usually with palmate venation <sup>4</sup> and a watery sap. Flowers regular <sup>5</sup>, unisexual and axillary. Corolla consists of 5 fused, usually white, yellow or orange petals. Anthers mostly 3, variously fused, usually bent or undulate <sup>6</sup>. Ovary inferior <sup>7</sup>. Stigma usually has 2 or 3 fleshy lobes. Fruit a large berry <sup>8</sup> with a hard leathery wall, sometimes with prickles or warts; with parietal placentation. Seeds  $\pm$  flattened <sup>9</sup>.



**DID YOU KNOW:** The earliest record of human use of edible cucurbits is from Mexico where stored seeds of squashes were found in ruins dated to  $\pm$  5 000 B.C.



*Citrullus*

MK

*Gerrardanthus*

NC

*Cucumis*

HV

*Coccinia*

JB

*Peponium*

GN

*Acanthosicyos*

HV

*Kedrostis*

SPB

*Citrullus*

JK



*Momordica*

JB



*Cucumis*

SPB



*Momordica*

GN



*Trochomeria*

SPB



*Coccinia*

JB



*Zehneria*

HV



*Momordica*

SPB



*Coccinia*

GN



*Gerrardanthus*

NC



# ERICACEAE

## Erica family

A large family of mainly evergreen or deciduous shrubs with a cosmopolitan distribution. The plants are mostly sclerophyllous and are one of the main components of fynbos. Plants are grown for their ornamental use and as cut flowers in the flower industry.

### General information

**Number of genera/species in the world:** ca. 140/ca. 4 500.

**Number of genera/species in FSA:** 2/963.

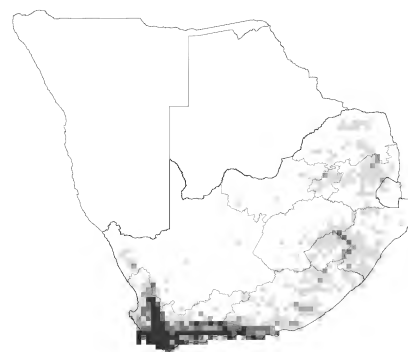
**Well-known FSA genera:** *Erica*, *Vaccinium*.

**Growth forms:** Mainly evergreen or deciduous shrubs, scramblers or climbers, herbs or trees.

**Habitats:** Usually in seasonally dry places with a low organic component in acidic soils.

### Flagship species

*Erica cerinthoides* (fire heath; rooihaartjie [A]; semomonyane [SS]) is the widest distributed of all native South African ericas. In the southwestern Cape, plants can attain a height of 1.5 m. In grasslands of the Drakensberg and Mpumalanga escarpment, plants tend to be smaller in areas that are prone to fire. Flower colour varies from several shades of red and pink to white and even white with pink tips. (Photo: GN).



### Distribution

The family has a cosmopolitan distribution, but is found mostly in temperate, warm temperate and montane tropical areas. In southern Africa it has its highest diversity in the southern and southwestern Cape.

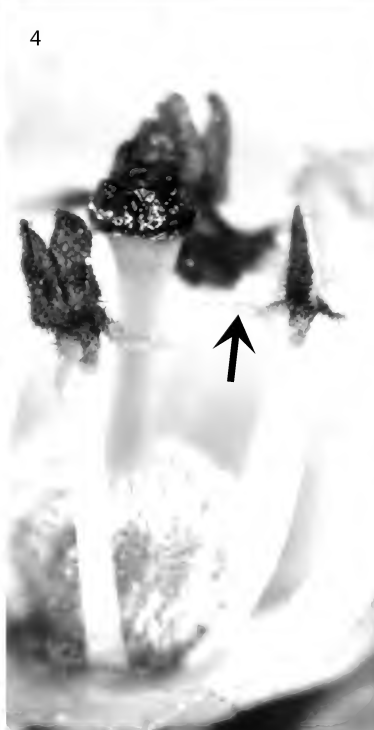
### Significance

Genera such as *\*Arbutus*, *Erica*, *\*Kalmia* and *\*Pieris* have glossy evergreen foliage and bright flowers and are important in the cut flower industry. *\*Rhododendron* is extremely important in horticulture. Cranberries and blueberries are among the major fruit crops produced from Ericaceae. The abundance of *Erica* in the Western Cape makes it important in the production of honey in this region. Honey produced from some of the *\*Rhododendron* species can apparently be toxic.



## HOW TO IDENTIFY

Leaves whorled <sup>1</sup> or alternate; reduced and leathery; without bracts. Flowers regular. Corolla 4 or 5, fused into a short or obvious tube <sup>2</sup>. Anthers mostly 10 (or double the number of corolla lobes), open with pores <sup>3</sup>, frequently with tails <sup>4</sup>. Ovary superior, usually with a basal disc <sup>5</sup>. Fruit a capsule, berry or drupe.



**DID YOU KNOW:** One of the most easily grown ericas, *Erica verticillata*, became extinct in the wild in the 20th century.







*Erica*

SPB



*Erica*

SPB



*Erica*

SPB



*Erica*

SPB



*Erica*

SPB



*Erica*

GN



*Erica*

MK



*Vaccinium*

JB



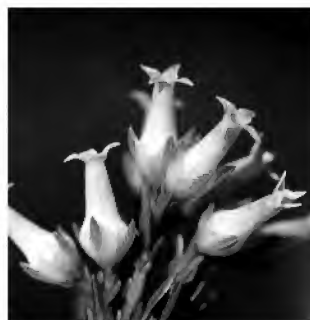
*Erica*

SPB



*Erica*

SPB



*Erica*

SPB



*Erica*

SPB



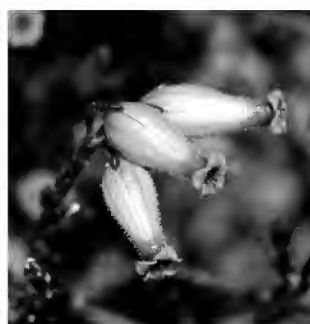
*Erica*

SPB



*Erica*

MK



*Erica*

MK



*Erica*

GN



*Erica*

SPB



*Erica*

SPB



*Erica*

GN



# GENTIANACEAE

(including Loganiaceae)

## Gentian family

A widespread family of herbs to large trees with opposite leaves and regular flowers. Plants are usually completely glabrous.

### General information

**Number of genera/species in the world:** ca. 89/ca. 1 650.

**Number of genera/species in FSA:** 9/84.

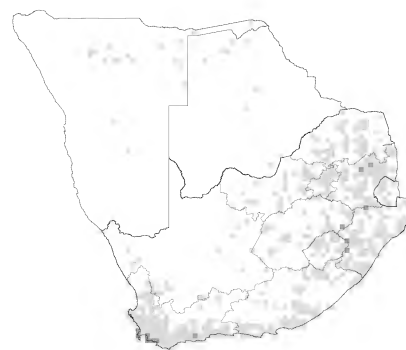
**Well-known FSA genera:** *Chironia*, *Sebaea*.

**Growth forms:** Annual or perennial herbs or shrubs, seldom trees (*Anthocleista*).

**Habitats:** Most often found in open, grassy places.

### Flagship species

*Chironia baccifera* (Christmas berry; bitterbossie [A]) is a much-branched shrublet or suffrutex of up to 1 m high, found on sandy areas, mostly coastal, from Namaqualand to KwaZulu-Natal. The pink flowers appear in spring and summer, followed by red berries in late summer. It is a well-known medicinal plant used to treat haemorrhoids, diarrhoea and boils. A decoction of the plant is also taken as a blood purifier. The plant is poisonous to sheep.



### Distribution

Found worldwide from arctic tundra to tropical forest, but mostly in temperate and subtropical areas. In southern Africa this family is widespread but almost absent from the dry interior.

### Significance

Many species are cultivated as garden ornamentals (*\*Gentiana*, *\*Sabatia*). The rhizomes contain a bitter component that is used medicinally as a digestive aid (*\*Gentiana*, *Swertia*). In southern Africa, *Sebaea* species are used as love charm emetics or to treat snakebite and dysentery.



## HOW TO IDENTIFY

Leaves opposite <sup>1</sup>, or in a basal rosette, simple and often united at the base; without stipules. Flowers regular <sup>2</sup> with 4 or 5 united sepals and petals <sup>3</sup>; petals are often twisted in the bud <sup>4</sup>. Ovary superior <sup>5</sup>. Fruit usually a dehiscent capsule <sup>6</sup>, rarely berry-like (*Chironia*, *Anthocleista*).



DID YOU KNOW: The bitter substances found in this family are the main commercial source of bitter tonic and are also used in Suze, an aperitif popular in France.



*Orphium*

MK

*Chironia*

MK

*Orphium*

MK

*Sebaea*

MK

*Anthocleista*

SPB

*Chironia*

SPB



*Anthocleista*

MK



*Sebaea*

MK



*Chironia*

MK



*Chironia*

MK



*Sebaea*

SPB



*Sebaea*

JK



*Sebaea*

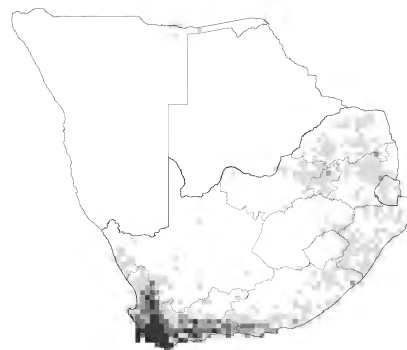
SPB



# PROTEACEAE

## Protea family

The protea inflorescence is one of the icons that has made South Africa famous. *Protea cynaroides* has been selected as our national flower and our national cricket team is named after the flower. In southern Africa the Proteaceae are largely endemic to the Cape Floral Kingdom. The family is also represented in Australia, tropical Africa and South America, with the highest diversity of more than 800 species in Australia.



### General information

**Number of genera/species in the world:** 64/1 400.

**Number of genera/species in FSA:** 17/382.

**Well-known FSA genera:** *Leucadendron*, *Leucospermum*, *Mimetes*, *Protea*, *Serruria*.

**Growth forms:** Woody shrubs or trees.

**Habitats:** Mountain slopes and foothills, usually in nutrient-poor soils, often in areas prone to mist.

### Distribution

In southern Africa the highest concentration and diversity of Proteaceae are found in the Western Cape. Outside this area plants are mostly found on mountainous or hilly terrain in the eastern and northern parts of the country.

### Flagship species

*Leucadendron argenteum* (silver tree; silwerboom [A]) has a very restricted distribution in the Western Cape, notably in Kirstenbosch and on the slopes of Table Mountain. It is named after the silky hairs on the leaves that give a silver shine to the tree. Trees are either male or female and flower from August to September. Trees grow easily from seed and are often planted in gardens, despite their susceptibility to fungal root pathogens, which easily kill mature trees.

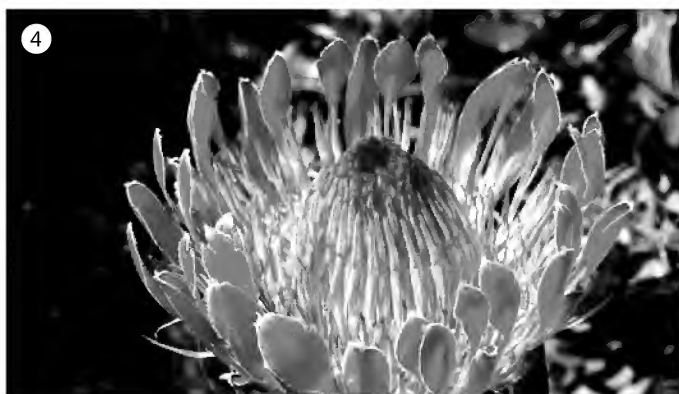
### Significance

Several species are cultivated and sold worldwide as cut flowers, while many species are also available in the horticultural trade as garden plants. Wild almond (*Brabejum stellatifolium*) has traditionally been used as a coffee substitute. The king protea (*Protea cynaroides*) is our magnificent national flower and produces a very large flowerhead up to 300 mm in diameter. The waboom (*P. nitida*) was a sought-after wood for wagon building. The syrup produced from the common sugarbush (*P. repens*) is a traditional Cape remedy to treat chest disorders.



## HOW TO IDENTIFY

Plants woody <sup>1</sup>. Leaves alternate. Flowers in heads <sup>2</sup> or spikes <sup>3</sup>, sometimes surrounded by showy bracts <sup>4</sup>; sepals 4, slender <sup>5</sup>; petals absent; anthers sessile on sepals <sup>6</sup>; stamens as many as petals, or more; ovary superior with 1 ovule. Fruit a nut <sup>7</sup>, drupe or follicle.



**DID YOU KNOW:** The macadamia tree (*Macadamia integrifolia*), which is widely cultivated for its nuts, was the first major food plant to originate from Australia.





*Aulax*

MK



*Mimetes*

HS



*Faurea*

MK



*Mimetes*

MK



*Leucadendron*

MK



*Protea*

HS



*Leucadendron*

MK



*Protea*

MK



*Paranomus* MK



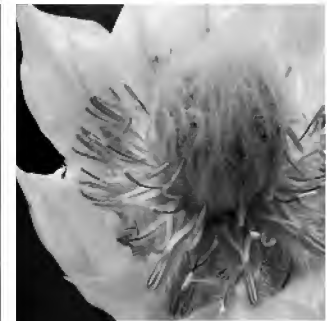
*Serruria* HS



*Leucadendron* EE



*Protea* HS



*Serruria* MK



*Leucospermum* HS



*Leucospermum* EE



*Diastella* MK



*Leucospermum* MK



*Spatalla* MK



## RUBIACEAE

### Gardenia family

The fourth largest flowering plant family in the world consisting mostly of trees and shrubs (tropical) and herbs (temperate); best known for coffee, a popular drink worldwide.

#### General information

**Number of genera/species in the world:** ca. 615/ca. 13 150.

**Number of genera/species in FSA:** 64/285.

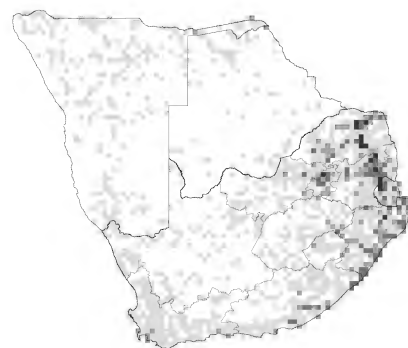
**Well-known FSA genera:** *Canthium*, *Gardenia*, *Pavetta*, *Vangueria*.

**Growth forms:** Mostly small trees or shrubs but also annual or perennial herbs, geofrutices, lianas and epiphytes.

**Habitats:** Found in arid vegetation, open scrub to forest margins, thicket and damp grassland; often the most species-rich woody plant family in tropical forest.

#### Flagship species

*Vangueria infausta* (wild medlar; wildemispel [A]; mmilo [NS]; umviyo [Z]) is a small deciduous tree found mainly on rocky hillsides in the northeastern parts of southern Africa. The leaves are velvety, often with galls on the upper surface. Fruit has a high vitamin C content and are eaten by people, birds, monkeys and antelope. Roots, fruit and leaves are used medicinally. The specific name means 'unlucky' and many people will not use the wood.



#### Distribution

Mostly found in tropical and subtropical regions but also represented by species in temperate and cold regions. Widespread in southern Africa, but concentrated in the northeastern summer-rainfall areas.

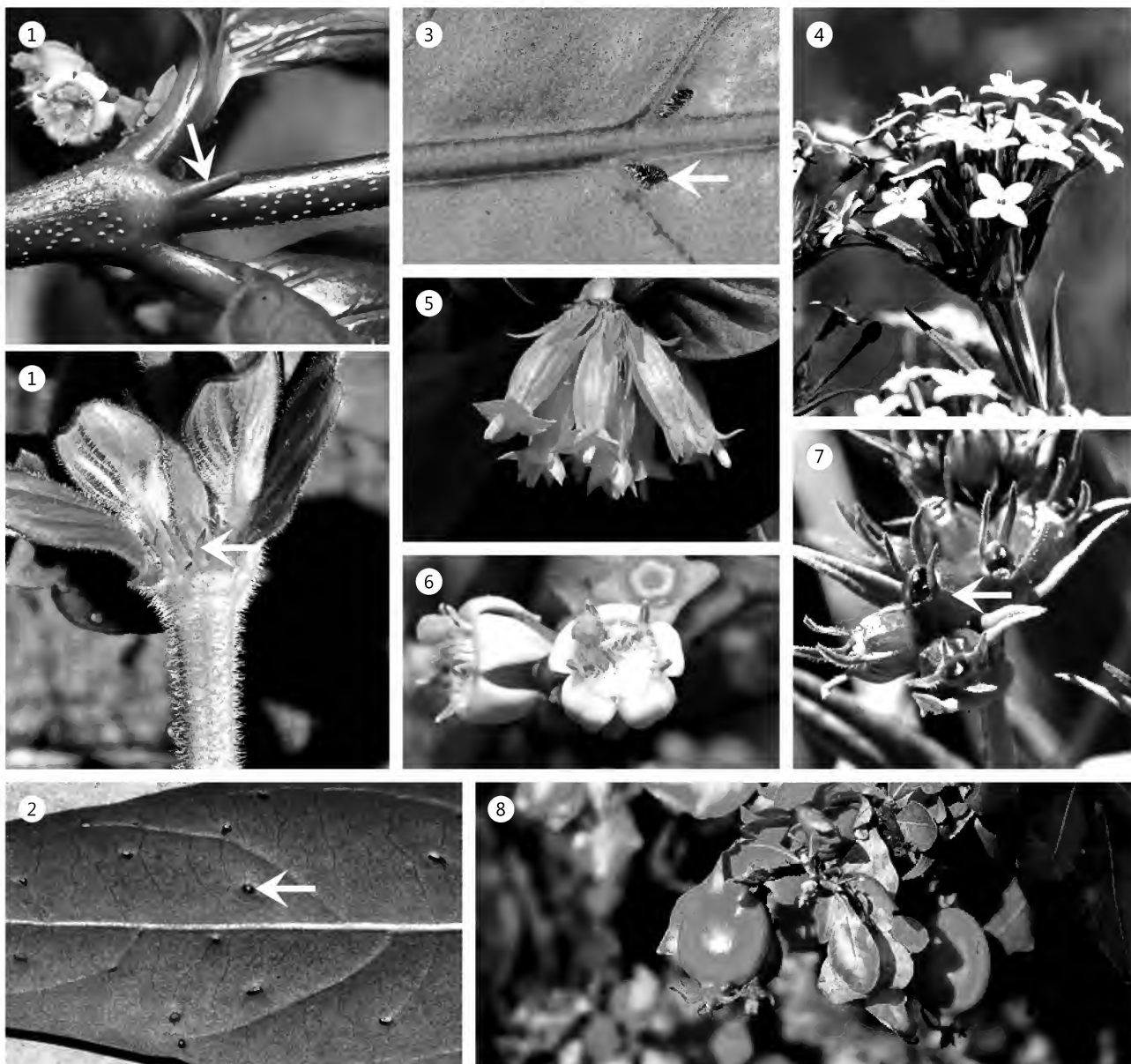
#### Significance

An economically important family, as the genus *Coffea* is the main source of coffee. Members of the family also provide the dyes 'madder' (*Rubia*) and 'gambier' (*\*Uncaria*). Many tropical species are cultivated as garden ornamentals (*Gardenia*, *Rothmannia*, *Pavetta*). Numerous taxa have local medicinal uses (*Pentanisia*, *Rothmannia*). Quinine (*\*Cinchona* species) was an important malarial prophylaxis and is still used as a food and drink flavouring. Some members are toxic to livestock (*Pachystigma*, *Pavetta*). *Gardenia* is a source of essential oils used in the perfume industry.



## HOW TO IDENTIFY

Leaves opposite, sometimes whorled, always entire, with an interpetiolar stipule <sup>1</sup> or scar; some genera have leaves with bacterial nodules <sup>2</sup> (*Pavetta*, *Psychotria*) and/or domatia <sup>3</sup> (*Psydrax*). Flowers regular <sup>4</sup> and borne terminally or axillary; petals 4 or 5, united into a tube <sup>5</sup>, with the mouth of the tube usually hairy <sup>6</sup>. Ovary inferior <sup>7</sup> with mostly 2 locules. Fruit often crowned with persistent calyx lobes <sup>8</sup>.



**DID YOU KNOW:** *Gardenia florida*, a native of China, produces an essential oil that is widely used in the perfume industry. It takes approximately three to four tonnes of flowers to produce 500 g of absolute oil.



*Conostomium*

MK

*Nenax*

MK

*Pygmaeothamnus*

MK

*Gardenia*

HS

*Pavetta*

GN

*Cephalanthus*

MK

*Pentas*

SPB

*Psychotria*

SPB



*Psychotria*

MK



*Coffea*

GN



*Gaillonina*

MK



*Rothmannia*

GN



*Keetia*

GN



*Vangueria*

MK



*Pachystigma*

MK



*Pavetta*

MK



# SOLANACEAE

## Tomato family

The family is of major economic importance worldwide as a food source, including tomatoes, potatoes, aubergines, chillies and many others. In our region it is mostly known for exotic and weedy species as well as cultivated fruit and vegetables.

### General information

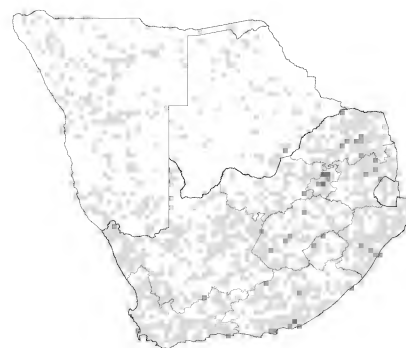
**Number of genera/species in the world:** 90/ca. 2 600.

**Number of genera/species in FSA:** 12/102.

**Well-known FSA genera:** *\*Capsicum*, *\*Cestrum*, *\*Datura*, *Lycium*, *Nicotiana*, *\*Physalis*, *Solanum*.

**Growth forms:** Herbs, shrubs or small trees.

**Habitats:** Widespread in natural veld, often as weeds on disturbed soils.



### Distribution

The family is distributed all over the world, mainly in tropical and subtropical regions. It is widespread throughout southern Africa with higher concentrations on the Highveld.

### Flagship species

*Lycium cinereum* (small honey-thorn; kleinblaarkriedoring [A]) is the most widespread species of the genus and can be found almost everywhere except in coastal Namaqualand, Kalahari and the eastern Lowveld. It is a stiffly-branched, very spiny shrub up to 2 m tall. Leaves are clustered on branches and spine-tipped side branches. Flowers are cream-coloured with purplish lobes. Fruits are fleshy, bright orange to red with a persistent calyx. Fruits are sought after by birds.

### Significance

Most of the economically important members of the family are exotic, naturalised or cultivated in southern Africa, e.g. Cape gooseberry (*\*Physalis peruviana*) and aubergine (*\*Solanum melongena*). Potato (*\*Solanum tuberosum*) is one of the most versatile vegetables; leaves of black nightshade (*\*Solanum nigrum*) are eaten as potherb and the fruits are eaten raw or made into jam; thornapple (*\*Datura stramonium*) is used in traditional medicine to treat respiratory difficulties and to reduce pain; winter cherry (*Withania somnifera*) is used medicinally.



## HOW TO IDENTIFY

Plants often have a strong scent when crushed. Leaves mostly alternate <sup>1</sup> with flowers often opposite the leaves <sup>2</sup>. Flowers regular; stamens open with apical pores <sup>3</sup> or longitudinal slits. Fruits fleshy berries <sup>4</sup> or dry capsules <sup>5</sup>; ovaries 2-chambered <sup>6</sup>, superior.



**DID YOU KNOW:** There are close to 4 000 different varieties of potato grown in the world, which makes it the fourth largest food crop.





*Solanum*

MK



*\*Cestrum*

MK



*Solanum*

MK



*\*Nicotiana*

SPB



*Withania*

GN



*Lycium*

MK



*Solanum*

MK



*Solanum*

MK

SOLANACEAE



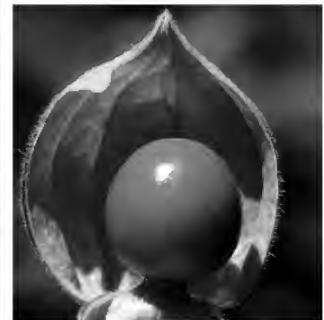
*Lycium*

MK



*\*Datura*

MK



*\*Physalis*

MK



*\*Brugmansia*

MK



*Solanum*

MK



*\*Datura*

MK



*Solanum*

MK



*\*Physalis*

MK



# THYMELAEACEAE

## Fibre-bark family

This medium-sized family of mostly shrubs and small trees is found in a variety of habitats around the world; mostly south of latitude 40° North.

### General information

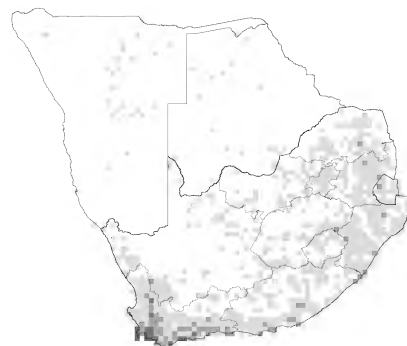
**Number of genera/species in the world:** ca. 45/ca. 890.

**Number of genera/species in FSA:** 8/202.

**Well-known FSA genera:** *Dais*, *Gnidia*, *Lachnaea*, *Passerina*.

**Growth forms:** Mostly shrubs or small trees but also lianas and herbs.

**Habitats:** Found in diverse habitats including tropical rainforests, open woodland, freshwater swamps, mountains, grassland and arid plains.



### Distribution

A cosmopolitan family found in temperate and tropical regions; well represented in Africa. In southern Africa the diversity is highest in the winter-rainfall parts of the Western Cape.

### Flagship species

*Dais cotinifolia* (pompom(n) tree; kannabas [A]; intozane [X]; intozane-emnyama [Z]) is a medium-sized deciduous to evergreen tree found in forest margins, thickets and riverine vegetation in the eastern parts of southern Africa. It flowers from November to February and is a popular garden plant that has been cultivated in Europe since the 18th century. The bark is used to make a good rope.



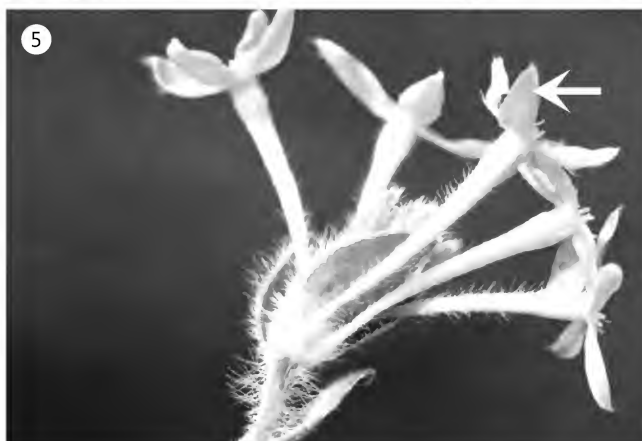
### Significance

Some species are cultivated as ornamental shrubs (*Dais*, *\*Daphne*, *Gnidia*). In Borneo the genus *\*Gonystylus* is a source of timber. Essential oils are produced from the wood of certain genera (*\*Aquilaria*, *\*Wikstroemia*). Historically the yellow flowers of *Gnidia* species were used to dye leather and wool while Khoisan used the stringy bark to tie bundles of wood. *Passerina* bushes were used to rapidly heat up outside ovens. Some members of the family (*Gnidia* species) are used as a fish poison or to treat boils and coughs.



## HOW TO IDENTIFY

Tough, fibrous bark <sup>1</sup>. Leaves opposite or alternate, without stipules, sometimes ericoid or needle-like <sup>2</sup>. Flowers long, tubular and mostly regular <sup>3</sup>, often in dense heads with bracts forming an involucre <sup>4</sup>. Sepals (4 or 5) petaloid, appearing like a continuation of the tube (hypanthium) <sup>5</sup>; petals inconspicuous <sup>6</sup> or absent. Ovary superior. Fruit an achene, berry or drupe.



**DID YOU KNOW:** Tubular flowers of most *Gnidia* and *Struthiola* species are sweetly scented at night and attract moths for pollination, but the genus *Passerina* is wind pollinated.





*Struthiola* ALV



*Lachnaea* MK



*Gnidia* SPB



*Gnidia* SPB



*Gnidia* MK



*Lachnaea* MK



*Dais* MK

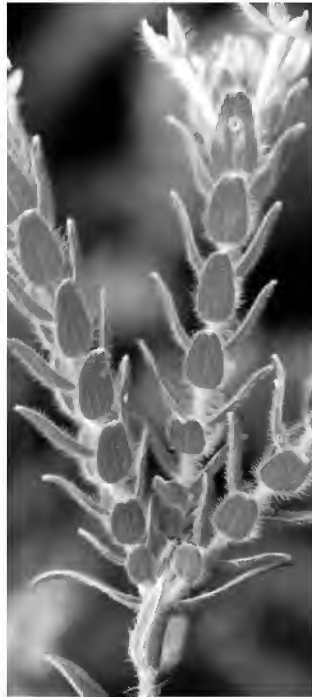


*Peddiea* GN



*Gnidia*

MK



*Struthiola*

MK



*Struthiola*

MK



*Gnidia*

HV



*Gnidia*

MK



*Gnidia*

MK



*Passerina*

MK



# ACANTHACEAE

## Pistol bush family

A diverse family of mostly annual or perennial herbs and shrubs, often spiny, with variously coloured and shaped flowers; well known as garden plants.

### General information

**Number of genera/species in the world:** ca. 350/ca. 4 350.

**Number of genera/species in FSA:** 43/373.

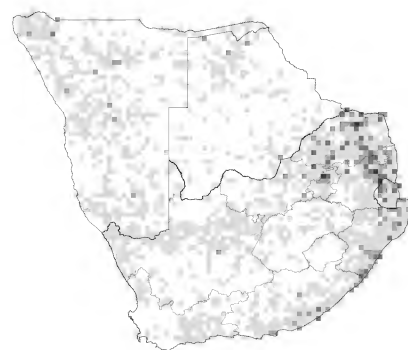
**Well-known FSA genera:** *Barleria*, *Duvernoia*, *Thunbergia*.

**Growth forms:** Herbs, shrublets, shrubs and sometimes climbers or small trees.

**Habitats:** Found from forest to arid regions.

### Flagship species

*Duvernoia adhatodoides* (pistol bush; pistoolbos [A]; isipheka [X]; lothabe [Z]) is a shrub or small tree found naturally in forests and along forest margins in the eastern parts of South Africa and Swaziland. The common name is derived from the fact that the fruits burst open with a loud explosive sound. It is a popular garden plant with compact sprays of flowers borne in the leaf axils during late summer. The heartwood is yellow, heavy and attractive and can be used to make small ornaments.



### Distribution

Occurring in tropical and subtropical regions; seldom found in temperate areas. In southern Africa the highest diversity is in the northeastern parts with relatively high summer-rainfall.

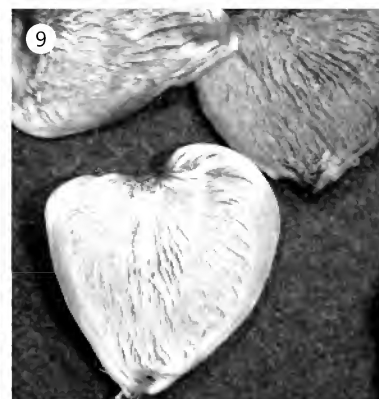
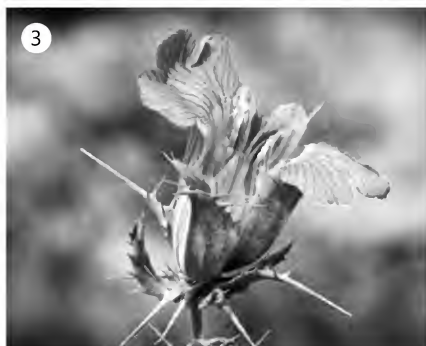
### Significance

Many species are cultivated as garden ornamentals (*Barleria*, *Justicia*, *Thunbergia*) or as plants to attract moths, butterflies, honeybees and wasps to city gardens (*Asystasia*, *Hypoestes*, *Isoglossa*). The family has limited local medicinal use as treatment for coughs, diarrhoea and fevers. An *Adhatoda* species is reportedly used to treat biliousness, while *Justicia capensis* is traditionally used to attract customers or improve chances of employment. Some members of the family are browsed by game and livestock (*Barleria*, *Justicia*, *Monechma*).



## HOW TO IDENTIFY

Nodes often swollen. Leaves opposite <sup>1</sup>, sometimes whorled, without stipules and usually with cystoliths in the epidermis. Bracts and bracteoles subtending individual flowers conspicuous, often coloured, large, leafy <sup>2</sup> or sometimes spiny <sup>3</sup>. Flowers borne in leaf axils or tight, terminal spike-like inflorescences. Flowers irregular (1- or 2-lipped) <sup>4</sup> or nearly regular <sup>5</sup>, with fused petals <sup>6</sup>. Ovary superior with two locules. Fruit an explosive club-shaped capsule <sup>7</sup> with seeds mostly borne on hook-like outgrowths <sup>8</sup>. Testa of some genera covered with hairs <sup>9</sup> that become slimy on wetting.



DID YOU KNOW: The leaves of the genus *Acanthus* were the inspiration for the motif on the capital of Corinthian columns in Greek temples.





*Barleria* GN



*Acanthopsis* MK



*Justicia* SPB



*Monechma* HV



*Thunbergia* SPB



*Blepharis* SPB



*Barleria* HV



*Metarungia* HS



*Mackaya*

MK



*Crabbea*

MK



*Barleria*

MK



*Sclerochiton*

GN



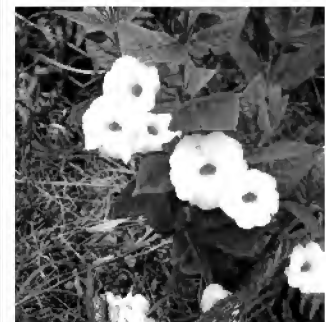
*Petalidium*

MK



*Petalidium*

JK



*Thunbergia*

JK



# LAMIACEAE

(Labiatae)

## Sage family

An economically important family with a wide range of uses in the medicinal, culinary and horticultural industries; also in the timber industry. Members of the family are closely related to the Scrophulariaceae.

### General information

**Number of genera/species in the world:** ca. 252/ca. 6 700.

**Number of genera/species in FSA:** 41/309.

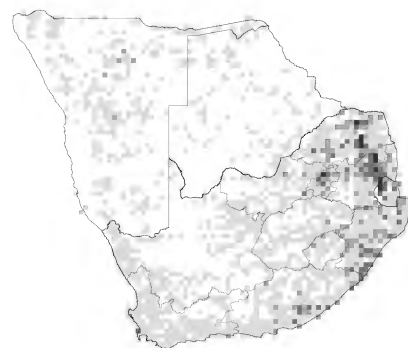
**Well-known FSA genera:** *Ballota*, *Clerodendrum*, *Leonotis*, *Ocimum*, *Plectranthus*, *Salvia*, *Syncolostemon*, *Vitex*.

**Growth forms:** Predominantly annual or perennial herbs, also shrubs and small to large trees and sometimes woody climbers.

**Habitats:** Found in almost all habitats from sea level to high altitudes and from tropical forest to the arctic tundra.

### Flagship species

*Leonotis leonurus* (wild dagga; duiwelstabak [A]; umfincafincane [X, Z]) is a robust shrub to 3 m high. It grows in tall grassland from sea level to 2 000 m. Used in a garden to attract nectar-feeding birds, bees and butterflies. This species has a whole range of medicinal as well as various traditional folklore uses. Since the 1600s *L. leonurus* has been cultivated in Europe. Because of its hardiness, it is a popular garden plant in areas of South Africa that are prone to frost.



### Distribution

Cosmopolitan in warm and temperate areas and characteristic of the Mediterranean region. In southern Africa it is mainly found in the eastern and northern parts of the region.

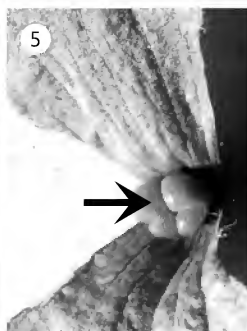
### Significance

Most species are aromatic and many are used as culinary herbs (e.g. sage, mint, oregano, thyme, lavender, rosemary and basil). The essential oils of *\*Pogostemon* and *\*Lavandula* are used in perfumes and those of *\*Perilla* in paints. Some species have edible tubers and leaves of others are used as potherbs. Many species are grown as garden ornamentals; teak (*\*Tectona grandis*) is an important timber hardwood. This family is a source of nectar for the honey industry. Some genera (e.g. *Ajuga* and *Teucrium*) are grown amongst crops to reduce predation by pests.



## HOW TO IDENTIFY

Aromatic herbs or small shrubs. Branches 4-angled (especially when young) <sup>1</sup>. Leaves simple, opposite <sup>2</sup>; pairs arranged at right angles to each other (decussate) <sup>3</sup>. Stipules absent. Inflorescence with leaf-like, reduced bracts. Flowers irregular, 2-lipped <sup>4</sup>; petals 5, united; stamens 2 or 4, of unequal length, attached to corolla; ovary superior and deeply 4-lobed <sup>5</sup>. Style arising from between the lobes. Fruit comprises 4 nutlets <sup>6</sup>.



**DID YOU KNOW:** The original family name Labiatae was given because the flowers typically have petals fused into an upper and a lower lip (Latin: *labia* = lips).



*Tinnea*

GN

*Ocimum*

SPB

*Plectranthus*

GN

*Rhabdosiella*

GN

*Salvia*

SPB

*Ballota*

SPB

*Thunbergia*

JB

*Salvia*

SPB

*Stachys*

SPB



*Plectranthus*

SPB



*Hemizygia*

GN



*Karomia*

GN



*Hoslundia*

GN



*Tinnea*

SPB



*Pycnostachys*

SPB



*Rothea*

SPB



*Ajuga*

HV



# LOBELIACEAE

(including Cyphiaceae)

## Lobelia family

A widespread, medium-sized family of mostly perennial herbs with irregular flowers. Sometimes included in Campanulaceae but has irregular flowers and connate anthers as opposed to regular flowers and free anthers as in Campanulaceae.

### General information

**Number of genera/species in the world:** ca. 30/ca. 1 260.

**Number of genera/species in FSA:** 6/187.

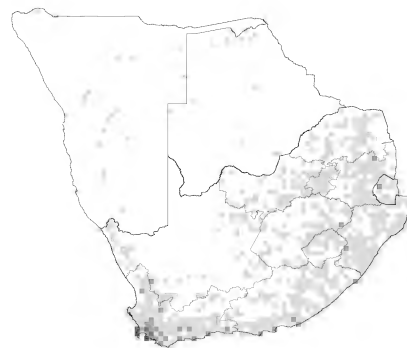
**Well-known FSA genera:** *Cyphia*, *Lobelia*, *Monopsis*.

**Growth forms:** Mostly herbs, also thick-stemmed and sparsely branched (pachycaul) giant herbs (e.g. *\*Lobelia deckenii*) and lianas, sometimes with twining stems (*Cyphia*).

**Habitats:** Found in a variety of habitats but often in moist places and forest.

### Flagship species

*Monopsis decipiens* (butterfly lobelia; skoenlapperplant [A]; isidala somkhuhlane [Z]) is an erect herb found in seasonally wet places in the eastern parts of southern Africa. The flowers are blue and purple with yellow markings on the lower lip and are solitary on a slender pedicel. This species is used in traditional medicine to treat colds, skin diseases and rheumatism.



### Distribution

Members of this family are mostly found in the tropics and the southern hemisphere. In southern Africa it is widespread, with the highest diversity in the Western Cape; uncommon in the dry interior.

### Significance

Latex from *Lobelia* species has been used medicinally to treat respiratory problems; *\*L. inflata* is a source of lobeline, used in anti-smoking therapy. Some *Lobelia* species are used in traditional medicine for eardrops and to treat colds; also used for magical purposes. The roots of certain *Cyphia* species are edible, eaten raw or roasted; they are also used in traditional medicine as an emetic. Some *Lobelia* species are popular garden plants, especially in window boxes and hanging baskets and some are browsed by game and livestock. Many members of the family are poisonous.



## HOW TO IDENTIFY

Plants usually contain milky latex <sup>1</sup>. Leaves simple, mostly alternate without stipules <sup>2</sup>. Flowers irregular (often 2-lipped) <sup>3</sup>, usually resupinate. Flowering parts usually pentamerous, united <sup>4</sup> or rarely free. Anthers connate into a tube <sup>5</sup> or free (*Cyphia*). Ovary inferior <sup>6</sup>. Fruit a dehiscent capsule often crowned by persistent calyx lobes <sup>7</sup>.



DID YOU KNOW: The family is named after Matthias de L'Obel [1538–1616], a Flemish botanist and physician to King James I of England.



*Cyphia*

SPB

*Monopsis*

SPB

*Lobelia*

MK

*Cyphia*

GN

*Lobelia*

MK

*Lobelia*

MK

*Lobelia*

MK



*Lobelia*

SPB



*Cyphia*

SPB



*Monopsis*

SPB



*Monopsis*

MK



*Monopsis*

MK



*Monopsis*

SPB



# OROBANCHACEAE

## Ink flower family

Members of the family often occur only sporadically but will always catch the eye. Flowers are brightly coloured and plants are usually seen as curiosities. They are frequently glandular and offer interesting photographic subjects. In some classifications many of the genera are included in the Scrophulariaceae but the relationships within the latter remain unresolved.

### General information

**Number of genera/species in the world:** 90/2 000.

**Number of genera/species in FSA:** 15/90.

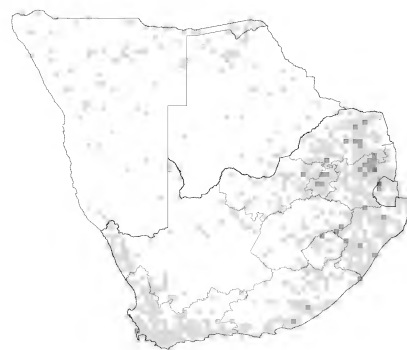
**Well-known FSA genera:** *Cycnium*, *Graderia*, *Harveya*, *Hyobanche*, *Orobanche*, *Sopubia*, *Striga*.

**Growth forms:** Annual or perennial herbs or shrubs, either holo- or hemiparasitic on the roots of plants.

**Habitats:** In deep or shallow sands, from coastal to inland dunes, in grassland and fynbos, often in rocky areas and on mountain slopes, also in cultivated lands.

### Flagship species

*Cycnium racemosum* (large pink ink plant; berginkplant [A]; uhlaba-hlangane [Z]) is up to 0.8 m tall and has very large pink, scented flowers in a terminal raceme. Flowers turn black when bruised. Plants are used traditionally to treat pain and ease childbirth. Usually found in grassland on rocky outcrops.

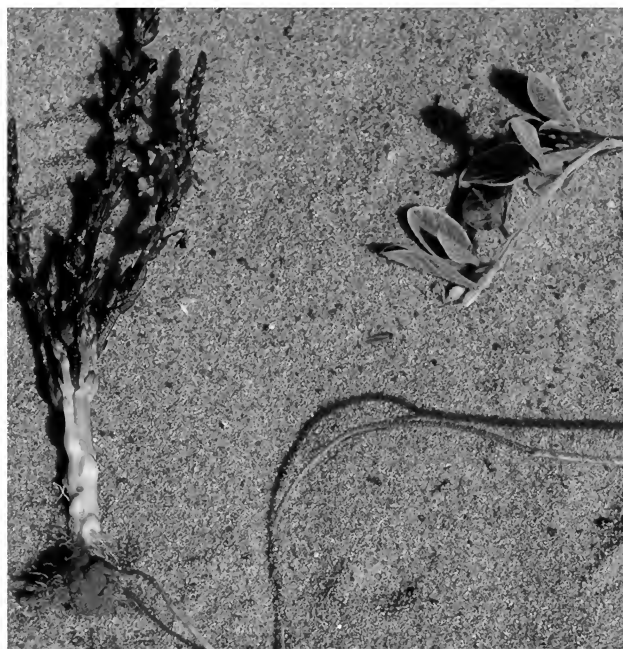


### Distribution

A cosmopolitan family found in the temperate areas of the world. In southern Africa a number of species are widespread. The highest density is in the eastern part of the country, but they are also found in the Northern and Western Cape.

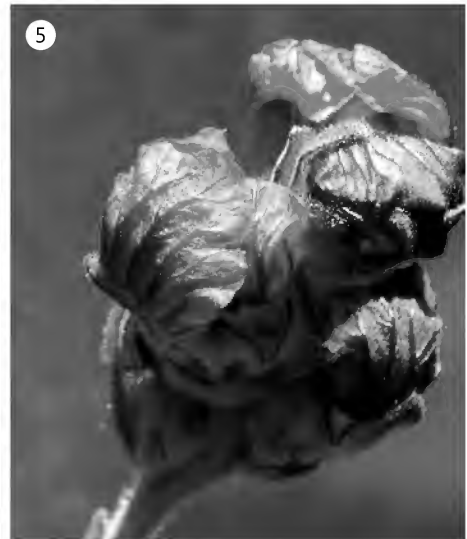
### Significance

The parasitic plants are important because of their negative impact on production of cultivated crops such as beans and peas. *Striga* species can become quite a nuisance in crops and are difficult to eradicate. (Photo: HV).



## HOW TO IDENTIFY

Parasitic plants <sup>1</sup>; turn black when damaged or pressed <sup>2</sup>. Leaves petiolate, sessile <sup>3</sup> or scale-like, alternate. Flowers irregular <sup>4</sup>, with 2–5 petals, lobes overlap or are just touching with middle lobe towards back <sup>5</sup>; ovary superior.



**DID YOU KNOW:** A holoparasite has no chlorophyll and cannot survive without a host, while a hemiparasite has green leaves and often also an extensive root system to produce and absorb nutrients.



*Striga*

SPB

*Harveya*

MK

*Alectra*

MK

*Graderia*

MK

*Harveya*

JK

*Harveya*

MK

*Cycnium*

MK

*Hyobanche*

MK



*Cycnium*

MK



*Hyobanche*

MK



*Graderia*

MK



*Sopubia*

GN



*Cycnium*

MK



*Harveya*

JK



*Harveya*

JK



*Sopubia*

MK



# SCROPHULARIACEAE

(excluding Orobanchaceae)

Snapdragon family

The family Scrophulariaceae (in a broad sense) consists of mainly annual or perennial herbs with flowers mostly irregular. Several genera have hairs that secrete oil to attract pollinators. There is no consensus on the circumscription of the family but ongoing molecular analyses aim to solve this problem. Genera such as *Craterostigma*, *Mimulus*, *Bowkeria* and *Halleria* have recently been assigned to other families but are retained here.

## General information

**Number of genera/species in the world:** ca. 269/ca. 5 100.

**Number of genera/species in FSA:** 66/900.

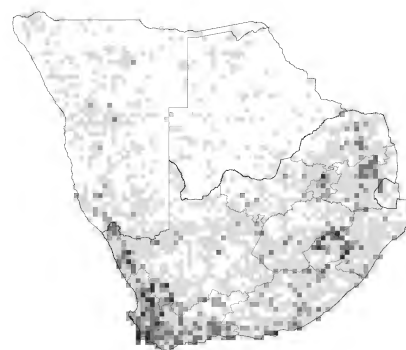
**Well-known FSA genera:** *Diascia*, *Freylinia*, *Halleria*, *Hebenstretia*, *Jamesbrittenia*, *Manulea*, *Nemesia*, *Phygelius*, *Selago*, *Zaluzianskya*.

**Growth forms:** Mainly annual, biennial or perennial herbs, dwarf shrubs or a few shrubs and rarely trees.

**Habitats:** In a wide range of habitats, but common in open grassland and high mountainous areas, rarely in disturbed areas in wet tropical forest.

## Flagship species

*Colpias mollis* (klipblom [A]) is one of a few members in the family that grows in cracks on rock faces. The species is restricted to the granite hills of Namaqualand. In springtime, plants are conspicuous on rock faces when covered with white or yellow flowers. After fertilisation, the pedicels grow away from the light towards the cracks in which the mother plant grows to deposit the ripened seed there, ensuring a suitable habitat for seedlings. This species is pollinated by oil-collecting bees.



## Distribution

A cosmopolitan family with higher diversity in temperate areas and tropical mountain regions. In southern Africa most species are found in the southern and western Cape extending up the West Coast through Namaqualand; also in the KwaZulu-Natal Drakensberg and on the Highveld of the northern provinces.

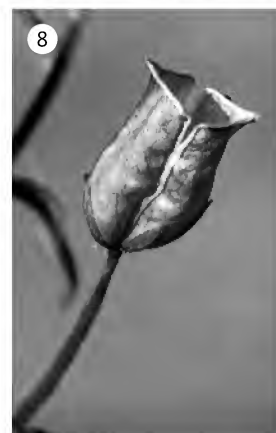
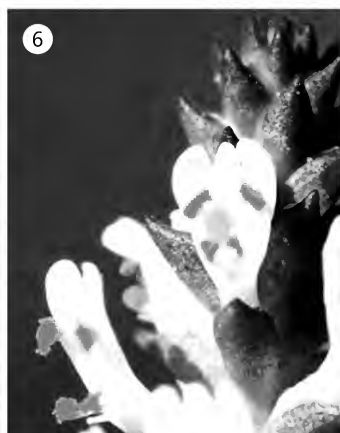
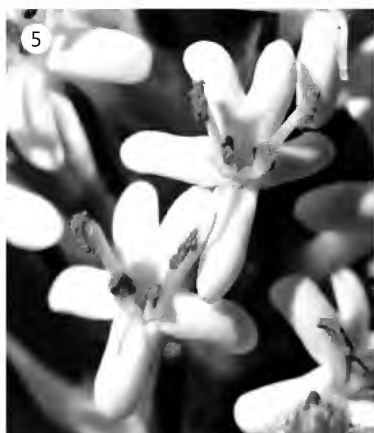
## Significance

Many species are important in horticulture as ornamental plants, such as *\*Antirrhinum*, *\*Calceolaria*, *\*Linaria*, *Mimulus*, *\*Pentstemon*, *Torenia* and *\*Verbascum*. Some medicinal plants included in the family are *\*Digitalis*, *\*Leptandra*, *\*Scrophularia* and *\*Verbascum*. The genus *Diascia* has co-evolved with bees of the genus *Rediviva*. The female bees collect oil from flowers to feed their larvae or sometimes to waterproof their nests. The length of the spurs of different *Diascia* species correlates with the length of the forelegs of the different bees leading to species-specific pollination.



## HOW TO IDENTIFY

Leaves mostly opposite <sup>1</sup> (sometimes decussate) or alternate, often opposite becoming alternate upwards, without stipules. Flowers mostly irregular <sup>2</sup>; corolla tubular <sup>3</sup>, 4–5-lobed, often 2-lipped <sup>4</sup>, then upper lip usually 2-lobed, lower one 3-lobed; in bud upper lobes usually external to other ones. Stamens often 4 <sup>5</sup>, 2 usually longer than the other 2, rarely only 2, inserted on corolla tube <sup>6</sup>. Ovary superior <sup>7</sup>. Fruit mostly a 2-locular capsule <sup>8</sup>, often with numerous seeds.



**DID YOU KNOW:** Foxglove is rich in digitalis, which was used as heart medication before artificial alternatives were available.



*Anticharis*

SPB

*Nemesia*

MK

*Craterostigma*

JB

*Nemesia*

SPB

*Zaluzianskya*

SPB

*Glumicalyx*

SPB

*Manulea*

SPB

*Jamesbrittenia*

MK



*Phygellus* SPB



*Lyperia* SPB



*Dischisma* SPB



*Alonsoa* MK



*Zaluzianskya* SPB



*Hebenstreitia* SPB



*Nemesia* SPB



*Selago* SPB





*Halleria*

GN



*Aptosimum*

SPB



*Diascia*

SPB



*Oftia*

SPB



*Zaluzianskya*

SPB



*Polycarena*

SPB



*Jamesbrittenia*

SPB



*Microdon*

SPB



*Manulea*

SPB



*Nemesia*

SPB



*Freylinia*

SPB



*Jamesbrittenia*

JB



*Chaenostoma*

SPB



*Tetranelago*

SPB



*Nemesia*

SPB



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# Glossary

This list is based on the glossary in *Seed plants of southern Africa: families and genera* (Leistner 2000) with additions from *The Kew plant glossary* (Beentje 2010).

Words in bold are defined elsewhere in the Glossary. Abbreviations: *adj.*, adjective; *pl.*, plural; *sing.*, singular; *syn.*, synonym; *vb.*, verb.

## A

**a-** (*prefix*): without, lacking.

**abaxial**: applied to the side or surface facing away from the axis or stem (compare **adaxial**).

**abscission**: the normal shedding from a plant of an organ that is mature or aged.

**achene**: a small dry fruit, not splitting when ripe, formed from a **superior** ovary of one **carpel** and containing a single seed, with the seed coat free from the fruit wall as in *Chenopodiaceae* (compare **cypsela**).

**actinomorphic**: applied to flowers which are radially symmetrical, i.e. capable of being bisected into similar halves in more than one vertical plane, forming mirror images (= **regular**) (compare **irregular**, **zygomorphic**).

**adaxial**: applied to the side facing the stem or axis (compare **abaxial**).

**adventitious**: applied to plant organs produced in an unusual or irregular position or at an unusual time of development, as in adventitious buds, roots or shoots.

**alternate**: applied to leaves and other organs inserted singly at different levels along the axis.

**androecium**: the **stamens** and accessories of one flower.

**androphore**: a stalk bearing the **androecium**.

**angiosperm**: a seed-bearing plant whose ovules, and hence seeds, develop within an ovary.

**anterior**: (applied to floral organs) in a position most remote from the axis (compare **posterior**).

**annual**: a plant whose life span ends within one year after germination (compare **biennial**).

**anther**: the part of the stamen which contains the pollen, usually comprising four **pollen sacs**, two in each half or lobe of the anther; the tissue separating the two sacs in each half usually disintegrates before **anthesis**, resulting in a 2-thecous/2-locular/2-celled anther.

**anthesis**: period during which the flower is open.

**apex** (*pl.* **apices**): tip; topmost part or terminal end.

**apical**: of the **apex**.

**aquatic**: living in water.

**areole**: a small pit or raised spot, often bearing a tuft of hairs or spines; a space marked out on a surface; a small area in a leaf between small veins.

**aril**: an appendage covering or partly enclosing the seed and arising from the stalk of the seed.

**awn**: a fine bristle usually terminating an organ, as at the tip of the **glumes** and **lemmas** in *Poaceae*.

**axil**: the angle between leaf or bract and the axis bearing it.

**axile placentation**: **placentation** with the **ovules** borne on the axis or the inner angle of the locules of a **syncarpous** ovary (see also **parietal placentation**).

**axillary**: arising from the **axil**.

## B

**bacterial nodule(s)**: (of leaves) dark inclusions formed of bacteria as in *Pavetta* (*Rubiaceae*).

**barbed**: with rigid points or lateral bristles pointing backwards.



**basal:** at the base.

**berry:** a juicy fruit with soft **pericarp**, the seeds immersed in pulp (compare **drupe**).

**bi-** (*prefix*): twice; two; having two.

**biennial(s):** taking two years from seedling stage to maturity, seed-set and death.

**bifid:** cleft into two parts for  $\pm$  half the length.

**bilabiate:** two-lipped

**bilocular:** with two **locules** or compartments.

**bipinnate:** when the primary divisions (pinnae) of a **pinnate** leaf are themselves pinnate.

**bisexual:** having both sexes in the same **flower** or **inflorescence**.

**bract:** a leaf-like structure, different in form from the foliage leaves and without an axillary bud, associated with an **inflorescence** or a **flower**.

**bracteole** (*adj.* **bracteolate**): small bract borne on the **pedicel** or **calyx** of a flower.

**bristle:** a stiff, strong **trichome**, similar to a pig's bristle, as in the **perianth** of some Cyperaceae.

**bud:** an undeveloped shoot that can give rise to a branch or flower.

**bulb:** a storage organ, usually underground, made up of a usually much abbreviated stem and fleshy leaf bases.

## C

**caducous:** falling off early.

**calyculus** (*pl.* **calyculi**; *adj.* **calyculate**): the bracts around the **calyx** or an **involucre** resembling an outer calyx (see also **epicalyx**).

**calyx** (*pl.* **calyces**): the outer envelope of the flower, consisting of free or united **sepals**.

**calyx tube:** when the **sepals** are partly united, the lower portion is referred to as the tube and the upper free part as the **limb** usually divided into calyx teeth, lobes or segments (see also **hypanthium**).

**capitate:** (1) like the head of a pin, as the **stigma** of some flowers; (2) collected into compact head-like clusters as the inflorescences of Asteraceae.

**capitulum** (*pl.* **capitula**): a dense head-like inflorescence usually of sessile flowers (see also **head**).

**capsule:** a dry fruit composed of two or more united **carpels** and either splitting when ripe into **valves** or opening by slits or pores.

**carpel:** an organ at the centre of a flower, bearing one or more **ovules** and having its margins fused together or fused with other carpels to enclose the ovule(s) in an **ovary**, and consisting also of a **stigma** and usually a **style**.

**carpellate:** possessing **carpels**.

**caruncle** (*adj.* **caruncular**/**carunculate**): an outgrowth from **integuments** at or near the **hilum** of certain seeds.

**caudex:** a short, thickened, often woody, vertical or branched perennial stem, usually subterranean or at ground level.

**ciliate:** with a fringe of hairs along the edge.

**cladode:** a flattened, foliaceous stem having the form and function of a leaf, but arising in the axil of a minute, bract-like caducous, true leaf (compare **phylloclode**).

**climber(s):** a plant that grows upwards by attaching itself to other structures which it uses as support; by contrast, a **scrambler** does not attach itself to its supports.

**clonal:** plants resulting from vegetative reproduction from a single parent and therefore identical to the parent.

**club-shaped:** gradually thickened from a slender base.

**colleter:** a mucilaginous secretory hair, often occurring in tufts near the base of the leaf blade or on the **calyx** as in Apocynaceae.

**compound:** the opposite of **simple**; composed of several similar parts, as a leaf of several leaflets; **compound fruit:** the fruits of separate flowers becoming united into a mass; **compound umbel:** each **ray** again bearing an **umbel**.

**compressed:** flattened lengthwise from side to side or from front to back.

**connate:** applied to parts of the same series which are united so closely that they cannot be separated without tearing.

**corm:** a tuberous bulb-like **rootstock**.

**corolla:** the inner envelope of the flower, consisting of free or united **petals**.

**corona:** a crown; circle of appendages between the **corolla** and **stamens**, often united in a ring, consists of one or two (sometimes three) alternating rows different in size and shape (in some members of the Apocynaceae).

**corymb** (*adj.* **corymbose**): a ± flat-topped **racemose inflorescence** in which the branches or **pedicels** start from different points but all reach to about the same level.

**cosmopolitan:** (of distribution) occurring all over the world.

**creeper:** a plant with stems running along the ground and rooting at intervals.

**cruciform:** cross-shaped.

**culm:** the stem of Cyperaceae and Poaceae.

**cultivar:** a cultivated variety of a species.

**cyathium:** an **inflorescence** resembling a single flower, composed of unisexual flowers surrounded by **bracts** and often by **glands**, typical of *Euphorbia* (Euphorbiaceae).

**cyme** (*adj.* **cymose**): a **determinate inflorescence** in which each flower, in turn, is formed at the tip of a growing axis, and further flowers are formed on branches arising below it (compare **indeterminate inflorescence**).

**cypsela** (*pl.* **cypselae**): an **achene** derived from a 1-loculed, **inferior** ovary; as in the indehiscent fruits of Asteraceae (compare **achene**).

**cystolith:** mineral concretion, usually of calcium carbonate, in the epidermis of e.g. Acanthaceae showing up as streaks or protuberances, particularly in dried material.

## D

**deciduous:** falling off at the end of the season of growth (compare **evergreen**).

**decussate:** in opposite pairs, with each pair at right angles to the one above and below it.

**dehiscent/dehiscing** (*noun* **dehiscence**): opening spontaneously when ripe as in **capsules** and **anthers**.

**determinate** (of an **inflorescence**): with a **bud** or **flower** terminating the growth of the main axis (compare **indeterminate**).

**di-** (*prefix*): two-.

**dicotyledon:** a flowering plant having two **cotyledons** in the seed (compare **monocotyledon**).

**digitate:** like the fingers of a hand, with the members arising from the same point.

**dimorphic/dimorphous:** of two forms.

**dioecious:** with unisexual flowers, the male and the female flowers on separate plants (compare **monoecious**).

**disc:** (1) an enlargement of the **receptacle** within the calyx or within the corolla or stamens, usually in the form of a ring, cup or cushion, often lobed or even cut up into so-called (nectary) **glands**; (2) **disc floret:** the central florets as compared with the **ray florets** in a head of the Asteraceae.

**disciform** (of heads of Asteraceae): with central flowers perfect with tubular **corollas**, and the marginal flowers **pistillate** or neuter but without **ligules**, their corollas tubular or wanting.

**discoïd:** (1) like a disc or plate; (2) applied to the heads of Asteraceae without **ray** flowers.

**distichous:** regularly arranged one above the other in two opposite rows, one on each side of the stem or **rachis**.

**domatium** (*pl.* **domatia**): small swelling/pocket on the lower surface of the leaf of some woody dicotyledons in the axils of the primary veins, usually partly enclosed by leaf tissue or hairs.

**dorsal:** relating to or situated on the face turned away from the axis; (of a leaf): the lower surface (compare **ventral**).



**drupe** (*adj.* **drupaceous**): an indehiscent, fleshy fruit, usually 1-seeded, in which the **pericarp** is clearly tripartite: a tough **exocarp**, a fleshy **mesocarp** and a hard **pericarp** and in the **aggregate 'fruit'** of e.g. *Rubus* (Rosaceae); **drupaceous** often refers to a fruit that is drupe-like but not strictly a drupe (compare **berry**).

## E

**elliptic**: in the form of a flattened circle more than twice as long as broad.

**endemic**: restricted to a specific area, not found naturally elsewhere.

**entire**: with an even margin without teeth, lobes, etc.

**epi-** (*prefix*): on, upon, above, over.

**epicalyx**: an **involucre** of **bracts** arising below the flower, resembling an extra **calyx**, as in some Malvaceae (see also **calyculus**).

**epidermis** (*adj.* **epidermal**): the outermost layer of cells of an organ, usually only one cell thick.

**epilithic**: living on rocks.

**epiphyte** (*adj.* **epiphytic**): a plant that grows on another plant but without deriving nourishment from it, i.e. not parasitic, as some ferns and orchids growing on trees.

**ericoid**: resembling plants of the family Ericaceae, especially their small, tough leaves.

**evergreen**: retaining its leaves throughout the year.

## F

**family**: a group of one to many genera believed to be related phylogenetically, usually clearly separable from other such groups; the major taxonomic group between genus and order.

**fibrous**: composed of or including fibres.

**-fid** (*suffix*): indicating number of parts into which an organ is cleft (divided up to  $\pm$  the middle).

**filament**: the stalk of a **stamen** supporting the an-

ther; a thin thread.

**floral**: belonging to or associated with a flower.

**floret**: small individual flowers that make up a (dense) inflorescence, as those in the **heads** of Asteraceae or the **spikelets** of Poaceae.

**flower**: the sexual reproductive structure of angiosperms, typically consisting of **gynoecium**, **androecium** and **perianth** and the **axis/receptacle** bearing these parts.

**foliaceous**: leaf-like.

**follicle** (*adj.* **follicular**): a fruit formed from a single **carpel** opening usually only along the inner (i.e. ventral) **suture** to which the seeds are attached.

**free**: neither adhering nor united.

**funicle/funiculus**: the stalk which attaches the **ovule** to the **placenta**.

## G

**gamopetalous**: with the **petals** united, either entirely or at the base into a tube, cup or ring.

**gamosepalous**: with united **sepals**.

**geniculate**: bent like a knee.

**genus** (*pl.* **genera**): a group of species believed to be related phylogenetically and usually clearly separable from other such groups, or a single species without close relatives; the major taxonomic rank between species and family.

**geofrutex** (*pl.* **geofrutices**): a shrub-like perennial with herbaceous stems from a woody rootstock.

**geophyte**: a perennial plant, usually herbaceous, with renewal buds located on the plant below the soil surface, as on **bulbs** or **rhizomes**.

**glabrous**: devoid of hairs.

**gland** (*adj.* **glandular/glandulose**): (1) secreting structure on the surface or embedded in the substance of a leaf, flower, etc., or raised on a stalk (glandular hairs or stipitate glands); (2) a warty protuberance or fleshy excrescence (often on petiole, inflorescence, or within the flower).

**glume:** a **bract**, usually chaffy, in the **spikelets** of Cyperaceae, Poaceae and similar plants.

**gynandrium:** a structure with stamens attached to the pistils, partly fused androecium and gynoecium.

**gynoecium:** the female part of the flower, consisting, when complete, of **ovary**, **style** and **stigma**; also called **pistil**.

**gynostegium** (*pl.* **gynostegia**): a structure formed by the union of the **stamens** with part of the **pistil**, as in Apocynaceae.

**gynostemium** (*pl.* **gynostemia**): the **column** in the centre of flowers of Orchidaceae formed by the union of the stamen with part of the **gynoecium**.

## H

**habitat:** the environment in which a plant lives.

**half-inferior** (of an **ovary**): partly below and partly above the level of attachment of **perianth** and **stamens**.

**head:** a dense **inflorescence** of sessile or nearly sessile flowers on a compound **receptacle** (see also **capitulum**).

**heartwood:** innermost and oldest dead wood in a tree, usually distinct in colour and properties from the outer sapwood.

**hemiparasite:** a plant that germinates without a host but thereafter becomes dependent on a host.

**hemispherical:** in the shape of half a sphere or globe.

**herb:** any vascular plant that never produces a woody stem.

**herbaceous:** not woody; soft in texture.

**hilum** (*adj.* **hilar**): the scar left on the seed where it was attached to the **funicle** or **placenta**.

**holoparasite:** a plant totally dependent on the host for its whole life cycle (without chlorophyll).

**hygrochastic:** applied to plants in which opening of the fruit and dispersion of the spores or seeds are caused by absorption of water.

**hygroscopic:** readily absorbing and retaining moisture from the atmosphere, resulting in changes in form or position of certain cells or structures.

**hypanthium** (*pl.* **hypanthia**): a cup or tube bearing floral parts above the base, and often above the top of the ovary of a flower, as in Rosaceae or Thymelaeaceae (see also **calyx tube**).

**hypogynous:** having the flower parts attached below the base of the ovary and free from it.

**hysteranthous** (of leaves): appearing after the flowers (compare **synanthous**).

## I

**imbricate:** (1) overlapping like tiles; (2) applied to parts in a flower bud where one **sepal** or **petal** is wholly internal and one wholly external and the others are overlapping at the edge only.

**indehiscent:** not opening when ripe.

**indeterminate** (of an **inflorescence**): the lateral or lower flowers mature first while the primary axis continues to grow, hence the terminal flower is the last to open, therefore a **racemose** inflorescence (compare **cymose**).

**indigenous:** occurring naturally in a specific area.

**indumentum:** any covering of a surface such as hairs, wool, scales.

**inferior:** beneath or below, as in a **calyx** which is below the **ovary**, the latter then being **superior**; as in an ovary which appears to be below the calyx, the latter being adherent to the ovary.

**inflorescence:** the arrangement of the flowers.

**integument:** one of the outer layers of tissue of an **ovule**.

**internode:** the portion of a stem between two nodes (compare **node**).

**interpetiolar:** applied to **stipules** placed between the **petioles** of opposite leaves.

**introduced:** not indigenous; not native to the area in which it now occurs (compare **naturalised**).



**involucre/involucrum** (*adj.* **involucral**): a number of bracts, e.g. those surrounding the base of a flower-head/**capitulum** or of an **umbel**.

**irregular** (of a flower, calyx or corolla): bilaterally symmetrical, symmetrical about one plane only, usually the plane that bisects the flower vertically along the longitudinal axis; (= **zygomorphic**) (compare **actinomorphic**, **regular**).

## K

**keel**: (*syn.* **carina**): a ridge like the keel of a boat; in Fabaceae a boat-shaped structure formed by the fusion of the two **anterior petals**.

## L

**lanceolate**: lance-shaped; about four times as long as broad, broadest in the lower half and tapering toward the apex.

**laterally**: on or at the side or margin.

**latex**: a viscous fluid exuded from the cut surfaces of leaves and stems of certain plants.

**legume**: a simple fruit, consisting of a single **carpel**, usually dry and usually opening along both **sutures** into two halves, as in the Fabaceae.

**lemma**: the lower of two **bracts** enclosing the florets of Poaceae.

**liana/liane**: a woody climber with rope-like stems.

**ligulate**: strap-shaped, applied e.g. to the **ray** florets in many Asteraceae.

**ligule**: (1) a thin, membranous and/or hairy appendage at the top of the leaf sheath as in Poaceae; (2) the **limb of ray florets** in Asteraceae.

**limb**: the upper, usually expanded part of the calyx or corolla above the tube, throat or claw.

**linear**: long and very narrow in relation to the length and with parallel edges.

**lip**: (1) one of two divisions of a **gamosepalous calyx** or a **gamopetalous corolla** when it is cleft into an upper (posterior) and a lower (anterior) portion (see

**bilabiate**); (2) of an orchid: the lowest petal (the inner median perianth lobe), usually enlarged and different in form from the two lateral ones.

**lobe**: any division or segment of an organ (usually rounded); specifically a part of a leaf, petal or calyx cut less than halfway to the centre.

**locular**: having chambers; thus: **unilocular** = one-chambered; **bilocular** = two-chambered, etc.

**locule/loculus**: a chamber or cell of an ovary or fruit or anther containing ovules or seeds or pollen grains.

**loculicidal**: referring to the dehiscence of a fruit which splits down the middle of the cells or **locules** and not at the line of junction of the **carpels**.

## M

**mericarp**: one segment of a fruit that breaks at maturity into units derived from the individual carpels, as in Apiaceae or Malvaceae (see also **schizocarp**).

**mesocarp**: the fleshy portion of the wall of a succulent fruit inside the skin and outside the stony layer, if any, surrounding the seed(s) (see also **pericarp**).

**monocotyledon**: a flowering plant having a single **cotyledon** in the seed (compare **dicotyledon**).

**monoecious**: with male and female flowers separate but borne on the same individual plant.

## N

**naturalised**: introduced and reproducing itself without human assistance (compare **introduced**).

**nectar guides**: floral orientation cues directing a pollinator to the nectar.

**nectary/nectarium** (*adj.* **nectariferous**): any structure that secretes nectar.

**node**: the point on the stem at which a leaf or leaves and accompanying organs arise (compare **internode**).

**nut**: a one-seeded indehiscent fruit, with a hard, dry **pericarp** (the shell).

**nutlet**: a little **nut**.

## O

**ob-** (*prefix*): inverse or inversely, e.g. **obovate** = inversely **ovate**.

**oblong**: much longer than broad, with nearly parallel sides.

**obovate**: **ovate** with the broadest part above.

**obovoid**: solid shape of **obovate** outline.

**opposite**: (1) pertaining to leaves or branches when two are borne at the same **node** on opposite sides of the stem; (2) one part before another, as a stamen in front of a petal.

**ovary**: that part of the **pistil** (the usually enlarged base) which contains the **ovules** and eventually becomes the fruit.

**ovate**: with the outline of an egg: scarcely twice as long as broad, with the broader end below the middle.

**ovule**: the immature seed in the ovary before fertilisation.

## P

**pachycaul**: thick-stemmed and sparsely branched, often used for describing bottle-shaped trunks.

**palea** (*pl.* **paleae**; *adj.* **paleate**): (1) one of the chaffy scales or thin colourless bracts amongst the flowers on the **receptacle**, in Asteraceae; (2) the inner of two bracts enclosing the **floret**, in Poaceae.

**palmate** (of a leaf): shaped like the palm and fingers of a hand (see **digitate**).

**panicle** (*adj.* **paniculate**): a compound **raceme**; an **indeterminate** inflorescence in which the flowers are borne on branches of the main axis or on further branches of these.

**papilla** (*pl.* **papillae**): a soft, nipple-shaped protuberance; a type of **trichome**.

**papillose**: covered with minute, nipple-like protuberances.

**pappus**: the ring of hairs or scales around the top of the fruit as in Asteraceae, and perhaps representing the calyx limb.

**parasite**: an organism living on or in a different organism and deriving nourishment from it.

**parietal placentation**: **placentation** with the **ovules** borne on the inner surface of the wall of the **ovary** or on intrusions of the wall that form incomplete partitions or false septa (compare **axile placentation**).

**pedicel** (*adj.* **pedicellate**/**pedicelled**): the stalk of an individual flower.

**peduncle** (*adj.* **pedunculate**/**peduncled**/**peduncular**): the stalk of an **inflorescence**; the common stalk (**rachis** or **axis**) of several **pedicellate** or **sessile** flowers.

**pendent**/**pendulous**: hanging down.

**perennial**: a plant whose life span extends over more than two growing seasons.

**perianth**: the floral envelope, consisting of **calyx** or **corolla** or both.

**pericarp**: the wall of the ripened ovary; its layers may be fused into one, or  $\pm$  divisible into **epicarp**, **mesocarp** and **endocarp**.

**persistent**: remaining attached to the plant beyond the expected time of falling.

**petal**: see **corolla**.

**petaloid**/**petaline**: resembling **petals**.

**petiole** (*adj.* **petiolar**): leaf stalk.

**phylloclade** (*syn.* **cladode**): a flattened foliaceous stem having the form and function of a leaf but arising in the axil of a minute, bract-like, often caducous, true leaf.

**pinna** (*pl.* **pinnae**): a primary division of a **pinnate** leaf.

**pinnate**: like a feather in appearance; (of a compound leaf): with the leaflets arranged along each side of a common **rachis**; (of the venation of a leaf): with a middle vein and secondary veins arising from it on each side.

**pistil**: see **gynoecium**.

**pith**: spongy tissue usually in the centre of a stem or branch.



**placenta:** the part of the ovary, sometimes but not always thickened or raised, to which the ovules are attached.

**placentation:** the arrangement of **placentas**, and hence of ovules, within an ovary.

**plumose:** like a feather; with fine hairs branching from a central axis, as in the **pappus** of some Asteraceae.

**pollen:** the **microspores** of seed plants shed from **anthers**.

**pollinarium** (*pl.* **pollinaria**): the complex structure found in the flowers of many Apocynaceae where the pollen masses of two adjacent **thecae** are united for dispersal as a unit.

**pollinium** (*pl.* **pollinia**): a cohesive mass of pollen grains which are shed together and transported as a unit during pollination (e.g. in Apocynaceae and Orchidaceae).

**polyploid:** having more than two of the basic sets of chromosomes in the nucleus.

**prostrate** (*syn.* **procumbent**): trailing to lying on the ground without rooting at the nodes.

**pseudobulb:** a solid, above-ground, thickened or bulbiform stem, characteristic of some orchids.

**pubescent:** covered with soft, short, erect hairs.

## R

**raceme** (*adj.* **racemose**): an **indeterminate** inflorescence in which the flowers are borne on **pedicels** along an unbranched axis or **peduncle**, the terminal flowers being the youngest and last to open.

**rachis** (*pl.* **rachises** or **rachides**) (1) the axis of an inflorescence in which flower stalks occur at short intervals from each other, as in Poaceae; (2) the axis of a **pinnately** compound leaf, corresponding to the midrib of a simple leaf.

**radiate:** applied to flowerheads of Asteraceae with **ray** florets.

**radical:** applied to leaves which arise so close to the base of the stem as to appear to arise on the root.

**ray:** (1) the florets of the margin of a flowerhead of the Asteraceae when different from those of the centre or disc; (2) one of the radiating branches of an **umbel**.

**receptacle** (*adj.* **receptacular**): the extremity of the axis on which the parts of the flower, sepals, petals, stamens and pistil are inserted.

**regular** (*syn.* **actinomorphic**) (of a flower, calyx or corolla): radially symmetrical, i.e. capable of being dissected into similar halves in more than one vertical plane forming mirror images (compare **irregular**, **zygomorphic**).

**resin** (*adj.* **resinous**): a plant exudate, often sticky, insoluble in water.

**resupinate:** upside down because the pedicel or ovary is twisted through 180° as in flowers of Orchidaceae and Lobeliaceae.

**rhpidium** (*pl.* **rhpidia**; *adj.* **rhpidial**): a ± fan-shaped **cyme** with the lateral branches developed alternately on one side and then on the other, as in Aristeoideae (Iridaceae).

**rhizome** (*adj.* **rhizomatous**): a rootstock or root-like stem prostrate on or under the ground, sending rootlets downwards, and branches, leaves or flowering shoots upwards, always distinguished from a true root by the presence of buds, leaves or scales.

**rootstock:** a short swollen structure at the junction of the root and the shoot system of a plant.

**rosette:** a crowded, circular cluster of leaves or other organs.

**rosulate:** with the leaves in a circle or **rosette**.

## S

**scabrid/scabrous:** rough to the touch, usually from the presence of very short harsh hairs.

**scale:** (1) reduced or rudimentary leaf, usually **sessile** and **scarious** and seldom green; (2) a kind of **indumentum** in the form of small, flat discs attached by the centre; (3) any thin, usually small and dry structure.

**scape:** a naked flower stalk arising from the ground with **radical** or **rosulate** leaves.

**scapose:** bearing one or more flowers on a **scape**; in the form of a **scape**.

**scarious:** thin and dry, not green.

**schizocarp** (*adj.* **schizocarpic/schizocarpous**): a dry, dehiscent fruit which splits into two or more separate carpels (**mericarps**) at maturity, found in Apiaceae and Malvaceae.

**sclerophyllous:** with leaves stiffened by sclerenchyma.

**scrambler:** plant growing upward supporting itself on other vegetation or on objects but not twining or attaching itself (see also **twiner** and **climber**).

**sepal:** see **calyx**.

**septal** (of a **nectary**): occurring in the partitions of the ovary where the carpel walls are incompletely fused, especially in monocotyledons.

**septicidal:** referring to the dehiscence of a ripe **capsule** which splits open through the **septa** or **carpel** margins (compare **loculicidal**).

**septum** (*pl.* **septa**; *adj.* **septal**): dividing cross wall or partition; an internal partition of an ovary or fruit.

**sessile:** without a stalk.

**silicula** (*pl.* **siliculae**): a short **siliqua**, not much longer than broad.

**siliqua/silique** (*pl.* **siliquae/siliques**): a dry, dehiscent fruit formed from a superior ovary of two carpels, with two parietal placentas, divided into two compartments by a thin partition, opening by two **valves** which fall away from a frame on which the seeds are borne, as in Brassicaceae.

**simple:** of one piece or series, the opposite of **compound**, e.g. simple leaf: not divided into leaflets; (of a hair or inflorescence): not branched.

**solitary:** borne singly or alone.

**spathe** (*adj.* **spathaceous/spatheate**): a large bract enclosing a **spadix**, or one or more bracts enclosing a flower or inflorescence.

**species:** a **taxon** comprising one or more populations of individuals capable of interbreeding to produce fertile offspring.

**spicate:** arranged in a **spike**.

**spike:** an inflorescence with the flowers **sessile** along a simple undivided axis or rachis.

**spikelet:** a small **spike** composed of one or more flowers enclosed by **glumes** (as in Cyperaceae and Poaceae).

**spindle-shaped:** straight and tapering from a wider middle to both ends.

**spine:** a sharp-pointed, hardened structure modified from another organ (leaf, branch, stipule, etc.), or from part of an organ.

**spinescent:** spine-tipped, having **spines**.

**spinose:** spiny or having **spines**.

**spiral** (of leaves or floral organs): borne at different levels on the axis, in an ascending spiral.

**spur:** a slender, usually hollow extension of some part of the flower.

**stamen** (*adj.* **staminal**): in **angiosperms**, the pollen-producing structure in a flower usually consisting of an **anther** and a **filament**.

**staminode** (*adj.* **staminodial**): an abortive or vestigial **stamen** without a perfect anther, as in Mesembryanthemaceae.

**standard:** the large posterior petal (outside in the bud) of a corolla in the Papilionoideae (Fabaceae).

**stigma** (*adj.* **stigmatic/stigmatose**): the point or surface of the **pistil** which receives the pollen, either sessile (when there is no style) or on the top or surface of the **style** or its branches.

**stipule** (*adj.* **stipular**): leaf-like or scale-like appendage of a leaf, usually in pairs at the base of the petiole.

**stolon:** a runner which roots.

**stoloniferous:** having **stolons**; trailing over the soil surface and rooting at the nodes.

**style:** narrow upper part of an **ovary** supporting the **stigma**.

**sub-** (*prefix*): implying 'almost', e.g. **subacute**: almost acute; **subentire**: having a very slightly uneven margin.



**succulent**: a plant which accumulates water in fleshy, water-storing stems, leaves or roots; juicy, fleshy in reference to texture or appearance.

**suffrutex**: a perennial plant which is slightly woody only at the base.

**superior**: applied to an **ovary** when the sepals, petals and stamens are inserted below it (**hypogynous**); also when the **receptacle** bearing the calyx, corolla and stamens is prolonged so as to be separate from the ovary, but forms a cup surrounding it (**perigynous**) (compare **inferior**).

**symbiosis** (*pl. symbioses*): a close association of dissimilar organisms, either to a mutual advantage or without advantage. In a typical symbiosis the partners are dependent on each other.

**synanthous** (of leaves): appearing together with the flowers (compare **hysteranthous**).

**syncarpous**: composed of two or more united **carpels**.

## T

**tannin**: a complex yellowish or brownish aromatic compound found in many plants.

**tanniniferous**: producing **tannins**.

**taproot**: the main, descending root of a plant that has a single dominant root axis.

**taxon** (*pl. taxa*): a group or category, at any level, in a system for classifying organisms.

**tendril** (*adj. tendrillar/tendrillous*): a long, slender, coiling, modified leaf, or rarely stem, by which a climbing plant attaches to its support.

**tepal**: any of the members of a **perianth** that is not clearly differentiated into **calyx** and **corolla**.

**terminal**: at the apex.

**testa**: the outer coat of a seed.

**tetra-** (*prefix*): four-.

**thorn**: a modified plant organ, especially a stem, that is stiffened and ends in a pungent point.

**throat** (of a tubular **corolla**): the top of the tube, where the lobes arise from the tube.

**tri-** (*prefix*): three; thrice.

**tribe**: taxon ranking between family and genus.

**trichome**: an epidermal outgrowth, such as a hair or scale.

**trifoliate**: having three leaves.

**trifoliolate**: having three leaflets.

**tuber**: (1) a thickened branch of an underground stem, which produces buds; (2) a swollen root or branch of a root acting as a storage organ.

**tuberous**: swollen; (of roots): **tuber-like**.

**tuft** (*adj. tufted*): clump, cluster.

**tunic** (*adj. tunicate*) (of a **bulb** or **corm**): a loose membranous or fibrous outer skin which does not develop from the epidermis.

**twiner**: a plant supporting itself by the main or lateral stems coiling around another plant or structure.

## U

**umbel** (*adj. umbellate*): a **racemose** inflorescence in which all the divergent pedicels or **rays** arise in a cluster at the top of the peduncle and are of about equal length; **compound umbel**: each ray bears an umbel, each of the latter called a partial umbel; **simple umbel**: each ray terminates in a flower.

**uni-** (*prefix*): one-.

**unilateral** (racemes): with **flowers** grouped on one side of the **raceme**.

**unisexual**: bearing only male or only female reproductive organs.

**united**: fused together.

## V

**valve** (*adj. valvar*): one of the parts produced by the splitting of a **capsule** when ripe.

**venation**: the arrangement of veins of a leaf.

**ventral** (of a lateral organ): the upper or inner face or the surface facing the axis (compare **dorsal**).

## W

**weeds**: plants thriving in disturbed **habitats** and perceived to be in the wrong place.

**whorl** (*adj.* **whorled**): (1) a group of three or more parts at a **node**, e.g. leaves or branches; (2) a circle of floral organs, e.g. stamens, petals, carpels.

**wing** (*adj.* **winged**): (1) any flat membranous expansion; (2) one of the two lateral petals of a flower, as in the Papilionoideae (Fabaceae); (3) one of the **petaloid** sepals of the flower, as in Polygalaceae.

## X

**xeromorphic** (of plants or plant parts): having characteristics that serve as protection against excessive loss of moisture.

**xerophyte** (*adj.* **xerophytic**): a plant that is adapted to dry or arid habitats.

## Z

**zygomorphic**: applied to flowers which are bilaterally symmetrical, i.e. capable of being bisected into identical halves in one plane only, forming mirror images; (= **irregular**) (compare **actinomorphic**, **regular**).



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<i>Mimulus</i>	262	<i>Ornithoglossum</i>	50, 51	<i>Phragmites</i>	34
mint	250	Orobanchaceae	1, 5, 14, 258, 262	<i>Phygelius</i>	262, 265
mmilo	234	<i>Orobanche</i>	258	<i>Phylla</i>	158, 159, 160, 161
mohlatsane	174	<i>Orphium</i>	228	Phyllanthaceae	116
mokapana	218	<i>Oryza</i>	22, 33	<i>Phyllanthus</i>	116
mokgoto	116	<i>Oryza sativa</i>	22	<i>Phyllobolus</i>	140, 141
Molluginaceae	5, 10, 146	<i>Oscularia</i>	143	<i>Physalis</i>	238, 241
<i>Mollugo</i>	146, 147	<i>Osmitopsis</i>	190, 193	<i>Physalis peruviana</i>	238
<i>Momordica</i>	218, 221	<i>Osteospermum</i>	193	<i>Piaranthus</i>	183
<i>Monadenium</i>	116	<i>Osyridicarpus</i>	173	Picrodendraceae	116
<i>Mondia</i>	180	<i>Osyris</i>	170, 172, 173	<i>Pieris</i>	222
<i>Monechma</i>	246, 248	<i>Otholobium</i>	122	pig's ear	214
<i>Monopsis</i>	254, 256, 257	<i>Othonna</i>	184, 186, 187	<i>Pimpinella</i>	94
<i>Monopsis decipiens</i>	254	ouhout	162	pineapple flower	56
<i>Monsonia</i>	130, 132, 133	Oxalidaceae	5, 10, 150	pink garden sorrel	150
<i>Moraea</i>	62, 73, 74	<i>Oxalis</i>	150, 152, 153	pinks	104
		<i>Oxalis corniculata</i>	150	pistachio	88

pistol bush	246	quiver tree	44	<i>Sandersonia</i>	48, 50
Pistol bush family	12, 14, 246	<i>Radyera</i>	134, 137	sandpatat	211
pistoolbos	246	<i>Raphanus</i>	96	Santalaceae	5, 11, 170
plakkie	214	<i>Raphionacme</i>	183	<i>Santalum album</i>	170
<i>Platycarpha</i>	200	<i>Raspalia</i>	100	<i>Sapium</i>	116, 119
Platycarpheae	200	raspberries	162	<i>Saponaria</i>	104
<i>Platycarphella</i>	200	<i>Rauvolfia</i>	180	<i>Sarcocaulon</i>	130, 132, 133
<i>Plectranthus</i>	250, 252, 253	red disa	76	<i>Sarcocornia</i>	115
<i>Pleiospilos</i>	144	red grass	22	<i>Sarcostemma</i>	182
ploegbreker	120	<i>Rediviva</i>	262	<i>Sartidia</i>	32
Poaceae	1, 3, 4, 6, 22, 120, 269, 271, 272, 273, 274, 275, 276, 277	<i>Relhania</i>	188	<i>Satyrium</i>	76, 78, 79
<i>Podalyria</i>	123	<i>Restio</i>	36	<i>Scadoxus</i>	60, 62, 63
<i>Podocarpus falcatus</i>	41	Restionaceae	4, 6, 36	<i>Sceletium</i>	138, 140, 141
<i>Pogonarthria</i>	26	<i>Rhabdosiella</i>	252	<i>Schinopsis</i>	88
<i>Pogostemon</i>	250	Rhamnaceae	5, 11, 158	<i>Schinus molle</i>	88
<i>Polemannia</i>	92	<i>Rhamnus</i>	158	<i>Schinus terebinthifolius</i>	88
<i>Pollichia</i>	104, 106	<i>Rhamnus prinoides</i>	158	<i>Schizoglossum</i>	180
<i>Pollichia campestris</i>	104	<i>Rhizobium</i>	120	<i>Schkuhria</i>	200
Polycarena	266	<i>Rhodocoma</i>	36, 39	<i>Schotia</i>	120, 128, 129
<i>Polydora</i>	196	<i>Rhododendron</i>	222	<i>Schwantesia</i>	145
<i>Polygala</i>	154, 155, 156, 157	<i>Rhodohypoxis</i>	64, 66, 67	<i>Scirpoides</i>	21
Polygala family	11, 154	<i>Rhodohypoxis baurii</i>	64	<i>Sclerocarya</i>	88, 91
<i>Polygala fruticosa</i>	154	<i>Rhodohypoxis milloides</i>	64	<i>Sclerocarya birrea</i>	88
<i>Polygala myrtifolia</i>	154	rice	22, 23	<i>Sclerochiton</i>	249
<i>Polygala virgata</i>	154	<i>Richtersveldia</i>	182	<i>Scrophularia</i>	262
Polygalaceae	5, 11, 154, 279	<i>Ricinus communis</i>	116	Scrophulariaceae	1, 5, 13, 14, 250, 258, 262
<i>Polystachya</i>	76	<i>Riocrexia</i>	181	<i>Scutia</i>	159, 160
pompom tree	242	river lily	60	<i>Searsia</i>	88, 90, 91
Pooideae	28	riverlelie	60	<i>Sebaea</i>	226, 228, 229
potatoes	68, 150, 238	<i>Roella</i>	206, 208, 209	<i>Securidaca</i>	154, 156
<i>Prekia</i>	141	<i>Romulea</i>	70, 71	<i>Securidaca longipedunculata</i>	154
<i>Prismatocarpus</i>	206, 209	rooiarbossie	84	Sedge family	6, 18
<i>Prosphytochloa</i>	33	rooibos tea	121	<i>Selago</i>	262, 265
<i>Protea</i>	230, 232, 233	rooidisa	76	semo-monyane	222
<i>Protea cynaroides</i>	230	rooigras	22	<i>Senecio</i>	184, 186, 187
Protea family	11, 13, 230	rooihaartjie	222	Senecioneae	184, 186
<i>Protea nitida</i>	230	rooiomkommer	218	<i>Senna</i>	120, 128
<i>Protea repens</i>	230	rooistompie	100	Septemberbossie	154
Proteaceae	5, 11, 13, 15, 230	<i>Rosa</i>	162, 164	Septemberbush	154
<i>Protorhus</i>	90	Rosaceae	5, 11, 162, 272, 273	<i>Sericorema</i>	86
<i>Prunus</i>	162, 164, 165	Rose family	11, 162	serilele	214
<i>Prunus africana</i>	162	roselle	134	<i>Serruria</i>	230, 233
<i>Psammophora</i>	143	rosemary	250	<i>Sesbania</i>	125
<i>Psammotropha</i>	146, 148, 149	<i>Rothea</i>	253	<i>Sesuvium</i>	80, 82, 83
<i>Pseudosalacia</i>	110	<i>Rothmannia</i>	234, 237	<i>Setaria</i>	22, 24
<i>Psilocaulon</i>	138	<i>Rubia</i>	234	Sichuan pepper	166
<i>Psoralea</i>	124	Rubiaceae	5, 13, 234, 269	<i>Sida</i>	134, 136
<i>Psychotria</i>	235, 236, 237	<i>Rubus</i>	162, 164, 165, 272	<i>Silene</i>	104, 107
<i>Psydrax</i>	235	<i>Ruschia</i>	138, 142, 145	<i>Silene burchellii</i>	104
<i>Pterocarpus</i>	122, 123	Ruschioideae	142	silver bush	210
<i>Pterocelastrus</i>	108, 111	Rutaceae	5, 11, 166	silver tree	230
<i>Pteronia</i>	192	<i>Sabatia</i>	226	silwerboom	230
pumpkin	218	<i>Saccharum officinarum</i>	22	<i>Sinapsis</i>	96
<i>Pupalia</i>	87	safflower	184	<i>Sisymbrium</i>	96, 98
Putranjivaceae	116	saffron	68	<i>Sisymbrium capense</i>	96
<i>Putterlickia</i>	108, 110, 111	sage	250	skoenlapperplant	254
puzzle bush	202	Sage family	14, 250	slangkop	202
<i>Pycnostachys</i>	253	<i>Salacia</i>	108, 109, 111	small honey-thorn	238
<i>Pygmaeoathamnus</i>	236	<i>Salacia oblonga</i>	109	small knobwood	166
<i>Pyracantha</i>	162	<i>Salacia reticulata</i>	109	<i>Smodingium</i>	90
<i>Quaqua</i>	180	<i>Salsola</i>	112, 114	Snapdragon family	13, 14, 262
quinine	234	Salt bush family	9, 112	Solanaceae	5, 13, 238
quinoa	112	<i>Salvia</i>	250, 252	<i>Solanum</i>	238, 240, 241
		sandalwood	170, 171	<i>Solanum melongena</i>	238



<i>Solanum nigrum</i>	238	<i>Tetragonia decumbens</i>	80	<i>Vangueria</i>	234, 237
<i>Solanum tuberosum</i>	238	<i>Tetragonia tetragonoides</i>	80	<i>Vangueria infausta</i>	234
<i>Sonchus</i>	194	<i>Tetraselago</i>	267	<i>Vanilla</i>	76
<i>Sophora</i>	122	<i>Teucrium</i>	250	<i>Vanilla planiflora</i>	76
<i>Sopubia</i>	258, 261	<i>Thamnocalamus</i>	35	<i>Veltheimia</i>	56, 59
sour fig	138	<i>Thamnochortus</i>	36	<i>Vepris</i>	166, 169
spanspekbos	112	<i>Thamnochortus insignis</i>	36	<i>Verbascum</i>	262
<i>Sparaxis</i>	70	<i>Theilera</i>	206	<i>Verbesina</i>	195
<i>Spatalla</i>	233	<i>Themeda</i>	22, 24	<i>Vernonia</i>	196
<i>Spergularia</i>	107	<i>Themeda triandra</i>	22	<i>Vernonieae</i>	196
Spike-thorn family	9, 108	<i>Theobroma cacao</i>	174	violet tree	154
<i>Spiloxene</i>	64, 66, 67	theobromine	174	<i>Vitex</i>	250
spinach	80, 84, 112, 210, 218	<i>Thesidium</i>	170	viamlelie	48
<i>Spinacia oleracea</i>	112	<i>Thesium</i>	170, 172, 173	Vygie family	10, 138
<i>Spirostachys</i>	116, 117	<i>Thesium capitatum</i>	170	waboom	230
<i>Sporobolus</i>	22, 26	Thesium family	11, 170	<i>Wahlenbergia</i>	206, 208, 209
squashes	218, 219	<i>Thespesia</i>	137	<i>Waltheria</i>	174, 177
<i>Staavia</i>	100, 102, 103	<i>Thinopyrum</i>	29	water spinach	210
<i>Staberoha</i>	38, 39	thornapple	238	watermelon	218
<i>Stachys</i>	252	<i>Thorcroftia</i>	252	<i>Watsonia</i>	68, 70, 71
<i>Stapelia</i>	178, 183	<i>Thunbergia</i>	246, 248, 249	waving pelargonium	130
star fruit	151	thyme	250	waxberry	104
Star lily family	8, 64	Thymelaeaceae	5, 11, 13, 242, 273	<i>Wellstedtia</i>	205
Star-chestnut family	11, 174	Tiliaceae	134	wheat	23, 112
<i>Steganotaenia</i>	95	<i>Tinnea</i>	252, 253	<i>Whiteheadia</i>	58
<i>Stellaria media</i>	104	<i>Tithonia</i>	195	<i>Wiborgia</i>	124
sterblom	64	Tomato family	13, 238	<i>Wikstroemia</i>	242
<i>Sterculia</i>	174, 176	tomatoes	238	wild almond	230
<i>Sterculia murex</i>	174	<i>Torenia</i>	262	Wild currant family	8, 88
Sterculiaceae	5, 11, 134, 174	<i>Trachyandra</i>	46	wild dagga	250
<i>Stiburus</i>	27	<i>Tragia</i>	116, 119	wild medlar	234
<i>Stictocardia beraviensis</i>	210	<i>Tragus</i>	26	wild spinach	112
<i>Stipagrostis</i>	32	<i>Trianthema</i>	80, 82	wild stock	96
<i>Stoebe</i>	188, 189	<i>Tribolium</i>	30, 31	wildekastaing	166
stoneseed	202	<i>Trichodesma</i>	202, 204, 205	wildemalva	130
strawberries	162	<i>Trichodesma physaloides</i>	202	wildemispel	234
<i>Striga</i>	258, 260	<i>Trichodiadema</i>	145	wildepetersieliebos	92
<i>Strophanthus</i>	181	<i>Tripteris</i>	193	wildepynappel	56
<i>Struthiola</i>	243, 244, 245	<i>Triraphis</i>	27	<i>Willdenowia</i>	36, 39
sugar cane	22	<i>Tritonia</i>	70	winter cherry	238
sunflower	184, 195	<i>Trochomeria</i>	218, 221	<i>Withania</i>	238, 240
<i>Sutherlandia</i>	120, 122, 123, 125	tsamma	218	<i>Withania somnifera</i>	238
suurvy	138	turnip	96	<i>Witsenia</i>	75
sweet potato	210	<i>Tylecodon</i>	214, 216	wituintjie	68
<i>Swertia</i>	226	<i>Tylosema</i>	128	<i>Wurmbea</i>	48, 50, 51
<i>Symphyandra</i>	206	uBangalala	108	<i>Xenoscapa</i>	70
<i>Symphytum</i>	202, 203	ubuhlungu becanti	56	<i>Xenostegia</i>	212
<i>Syncolostemon</i>	250	ubuphuphu	84	<i>Xysmalobium</i>	178, 181
<i>Tabernaemontana</i>	182	uhlaba-hlangane	258	<i>Xysmalobium undulatum</i>	178
Tageteae	201	umathunga	56	yellow fluffy-seed	52
<i>Tagetes</i>	201	umbangandlala	92	yellow sorrel	150
tall star sedge	18	Umbelliferae	92	<i>Youngia</i>	194
<i>Tanquana</i>	143	umBhaba	166	<i>Zaluzianskya</i>	262, 264, 265
tansy	148	umfincafincane	250	<i>Zanthoxylum</i>	166, 168, 169
<i>Taraxacum</i>	194	umnduze	60	<i>Zanthoxylum capense</i>	166
Tarchonantheae	201	umnsinsana	120	<i>Zanthoxylum piperitum</i>	166
<i>Tarchonanthus</i>	201	umnyenye	158	<i>Zea mays</i>	22
tarragon	184	<i>Umtiza</i>	128	<i>Zehneria</i>	218, 221
teak	250	umtshitshi	162	<i>Zinnia</i>	195
<i>Teclea</i>	168, 169	umuzi	18	<i>Ziziphus</i>	158, 159, 161
<i>Tectona grandis</i>	250	umviyo	234	<i>Ziziphus jujuba</i>	158
<i>Tenrhynea</i>	189	<i>Uncaria</i>	234	<i>Ziziphus mucronata</i>	159
<i>Tephrosia</i>	123	<i>Ursinia</i>	190	<i>Zornia</i>	125
<i>Tetragonia</i>	80, 82, 83	<i>Vaccinium</i>	222, 224	zucchini	218

## Appendix A:

### Alphabetical list of all FSA families

Family	Number of genera	Number of species
Acanthaceae	43	373
Achariaceae	6	6
Agapanthaceae	1	16
Agavaceae	1	6
Aizoaceae	10	106
Alismataceae	5	6
Alliaceae	3	31
Amaranthaceae	24	84
Amaryllidaceae	20	266
Anacardiaceae	14	133
Annonaceae	8	15
Anthericaceae (including Hemerocallidaceae)	2	43
Apiaceae	48	240
Apocynaceae	94	787
Aponogetonaceae	1	10
Aquifoliaceae	1	1
Araceae	6	15
Araliaceae	4	19
Arecaceae	5	6
Aristolochiaceae	1	2
Asparagaceae	1	88
Asphodelaceae	10	636
Asteraceae	264	2 481
Avicenniaceae	1	1
Balanitaceae	1	4
Balanophoraceae	2	2
Balsaminaceae	1	5
Basellaceae	2	2
Begoniaceae	1	8
Behniaceae	1	1



Family	Number of genera	Number of species
Bignoniaceae	7	13
Bombacaceae	1	1
Boraginaceae	20	120
Brassicaceae	29	174
Bruniaceae	12	73
Buddlejaceae	3	14
Burmanniaceae	1	1
Burseraceae	1	37
Buxaceae	1	2
Cabombaceae	1	1
Cactaceae	11	25
Callitrichaceae	1	2
Campanulaceae	12	260
Canellaceae	1	1
Cannabaceae	1	3
Cannaceae	1	2
Capparaceae	9	66
Caprifoliaceae	1	1
Caryophyllaceae	22	87
Casuarinaceae	1	2
Celastraceae	24	92
Ceratophyllaceae	1	3
Chenopodiaceae	14	173
Chrysobalanaceae	1	3
Clusiaceae (including Hypericaceae)	2	13
Colchicaceae	9	104
Combretaceae	5	51
Commelinaceae	7	44
Connaraceae	2	2
Convolvulaceae	16	115
Cornaceae	1	1
Crassulaceae	6	430
Cucurbitaceae	16	78
Cunoniaceae	2	2
Cymodoceaceae	2	2
Cyperaceae	37	486

Family	Number of genera	Number of species
Cytinaceae	1	3
Dichapetalaceae	2	3
Dioscoreaceae	1	21
Dipsacaceae	2	24
Dracaenaceae	2	10
Droseraceae	2	22
Ebenaceae	2	57
Elatinaceae	2	13
Ericaceae	2	963
Eriocaulaceae	2	14
Eriospermaceae	1	118
Erythroxylaceae	2	6
Escalloniaceae	1	1
Euphorbiaceae (in broad sense)	54	537
Fabaceae	155	1 516
Fagaceae	1	1
Flacourtiaceae (including Samydaceae)	4	4
Flagellariaceae	1	1
Frankeniaceae	1	3
Fumariaceae	4	10
Geissolomataceae	1	1
Gentianaceae	9	84
Geraniaceae	5	339
Gesneriaceae	1	67
Gisekiaceae	1	3
Goodeniaceae	1	2
Greyiaceae	1	3
Grubbiaceae	1	6
Gunneraceae	1	1
Haemodoraceae	3	9
Haloragaceae	2	3
Hamamelidaceae	1	3
Hernandiaceae	1	1
Heteropyxidaceae	1	3
Hyacinthaceae	21	535
Hydnoraceae	1	3



<b>Family</b>	<b>Number of genera</b>	<b>Number of species</b>
Hydrocharitaceae	5	12
Hydrostachyaceae	1	1
Hypoxidaceae	6	87
Icacinaceae	3	8
Iridaceae	33	1 204
Juncaceae	2	24
Juncaginaceae	1	2
Kirkiaceae	1	3
Lamiaceae	41	309
Lanariaceae	1	1
Lauraceae	5	14
Lecythidaceae	1	1
Lemnaceae	4	10
Lentibulariaceae	2	19
Liliaceae	1	1
Limnocharitaceae	1	1
Linaceae	2	15
Loasaceae	1	1
Lobeliaceae	6	187
Loranthaceae	13	38
Lythraceae	6	47
Malpighiaceae	3	8
Malvaceae (in strict sense)	21	165
Melastomataceae	6	13
Meliaceae	11	19
Melianthaceae	2	11
Menispermaceae	7	14
Menyanthaceae	2	8
Mesembryanthemaceae	125	1 761
Molluginaceae	10	107
Monimiaceae	1	1
Montiniaceae	1	1
Moraceae	4	35
Moringaceae	1	1
Musaceae	1	1
Myoporaceae	1	1

Family	Number of genera	Number of species
Myricaceae	1	10
Myrothamnaceae	1	1
Myrsinaceae (including Maesaceae)	4	9
Myrtaceae	9	40
Najadaceae	1	4
Neuradaceae	2	7
Nyctaginaceae	5	20
Nymphaeaceae	1	6
Ochnaceae	2	15
Olcaceae	2	5
Oleaceae	7	31
Oliniaceae	1	6
Onagraceae	4	30
Opiliaceae	1	1
Orchidaceae	53	529
Orobanchaceae	15	90
Oxalidaceae	2	250
Papaveraceae	4	8
Passifloraceae	5	28
Pedaliaceae	11	40
Penaeaceae	7	28
Phytolaccaceae (including Lophiocarpaceae)	5	13
Piperaceae	2	6
Pittosporaceae	2	4
Plantaginaceae	1	15
Plumbaginaceae	3	27
Poaceae	200	1 016
Podostemaceae	4	4
Polygalaceae	4	214
Polygonaceae	7	55
Pontederiaceae	4	5
Portulacaceae	7	67
Potamogetonaceae	1	9
Primulaceae (including Theophrastaceae)	3	8
Prioniaceae	1	1
Proteaceae	17	382

Family	Number of genera	Number of species
Ptaeroxylaceae	1	1
Ranunculaceae	6	34
Resedaceae	2	5
Restionaceae	18	299
Rhamnaceae	10	201
Rhizophoraceae	4	8
Rhynchoalycaceae	1	1
Roridulaceae	1	2
Rosaceae	17	220
Rubiaceae	64	285
Ruppiaceae	1	2
Rutaceae	21	301
Salicaceae	8	31
Salvadoraceae	2	4
Santalaceae	5	187
Sapindaceae	15	29
Sapotaceae	7	15
Scrophulariaceae	66	900
Smilacaceae	1	1
Solanaceae	12	102
Sphenocleaceae	1	1
Sterculiaceae	7	181
Stilbaceae	6	13
Strelitziaceae	1	7
Strychnaceae	1	10
Tamaricaceae	1	6
Tecophilaeaceae	3	12
Thymelaeaceae	8	202
Tiliaceae	4	60
Trapaceae	1	2
Turneraceae	4	11
Typhaceae	1	2
Ulmaceae (including Celtidaceae)	4	7
Urticaceae	11	25
Vahliaceae	1	11
Valerianaceae	2	4



Family	Number of genera	Number of species
Velloziaceae	2	11
Verbenaceae	9	49
Violaceae	3	15
Viscaceae	1	19
Vitaceae	5	62
Xyridaceae	1	9
Zannichelliaceae	3	3
Zingiberaceae	3	6
Zosteraceae	1	1
Zygophyllaceae (including Peganaceae)	8	61

## Appendix B:

List of 52 largest families in FSA (in order of size)

Family	Number of genera	Number of species
Asteraceae	264	2 481
Mesembryanthemaceae	125	1 761
Fabaceae	155	1 516
Iridaceae	33	1 204
Poaceae	200	1 016
Ericaceae	2	963
Scrophulariaceae	66	900
Apocynaceae	94	787
Asphodelaceae	9	636
Hyacinthaceae	21	535
Orchidaceae	53	529
Cyperaceae	37	486
Euphorbiaceae	54	537
Crassulaceae	6	430
Proteaceae	17	382
Acanthaceae	43	373
Geraniaceae	5	339
Lamiaceae	41	309
Rutaceae	21	301
Restionaceae	18	299
Rubiaceae	64	285
Amaryllidaceae	20	266
Campanulaceae	12	260
Oxalidaceae	2	250
Apiaceae	48	240
Rosaceae	17	220
Polygalaceae	4	214
Thymelaeaceae	8	202
Rhamnaceae	10	201
Lobeliaceae	6	187

Family	Number of genera	Number of species
Santalaceae	5	187
Sterculiaceae	7	181
Brassicaceae	29	174
Chenopodiaceae	14	173
Malvaceae	21	165
Anacardiaceae	14	133
Boraginaceae	20	120
Eriospermaceae	1	118
Convolvulaceae	16	115
Molluginaceae	10	107
Aizoaceae	10	106
Colchicaceae	9	104
Solanaceae	12	102
Celastraceae	24	92
Orobanchaceae	15	90
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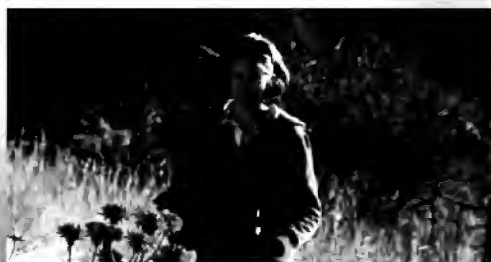


Southern Africa has a total of 225 plant families with the 52 largest families covering over 90% of the flora. The large number of plant species in this region (ca. 24 000) makes identification to species level relatively difficult and the first step is usually to determine the family to which a specimen belongs. Knowledge of plant families allows one to place unknown plants into broad categories and then to focus on a smaller search for the correct name. This book aims to introduce readers to the beauty and diversity of our fascinating flora, and to enable scholars, students, amateurs and professionals alike to identify plants to family level.

The identification process is introduced in a predominantly visual way by providing images to identify the key diagnostic characters for each family. The beauty of, and variation within each family is comprehensively illustrated with images of a range of genera. Additional information is provided on the distribution and usefulness of each family. It is hoped that this book will inspire readers to appreciate our indigenous flora.

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